PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 12 IN SET 339

	Motorola Model 56T1 (Ch. HS-483) was covered in Photofact Folder 12 - Set 339. Models 56T1A (Ch. HS-553) and 56T1B (Ch. HS-554) are added, along with late production changes, with the publication of this bulletin.
Ch. HS-483	TO INSURE PROPER OPERATING RANGE OF IF TRANSFORMERS C6, C9 and C12 are changed to a tolerance of 3%, part #21K124827. TO INCREASE OUTPUT POWER C2 is increased from 25MFD to 50MFD, part #23K635407. COMPONENT CHANGE A 3500MMF ceramic disc capacitor is added between the collector and base of X5, audio output. TO ADJUST GAIN In some models a 68K to 120K resistor is added in parallel with C6.
Ch. HS-553	Chassis HS-553 is electrically identical to chassis HS-483 except for the following changes. COMPONENT CHANGES X2, 1st IF Amplifier, is changed from a 2N146 to a 2N145, part #48C124220. X3, 2nd IF Amplifier, is changed from a 2N146 to a 2N145, part #48C124220. R7 is omitted and replaced with a jumper wire. R11 is decreased from 4700Ω to 2200Ω. R13 is omitted and replaced with a jumper wire. R15 is omitted. R18 is decreased from 120Ω to 82Ω.
Ch. HS-554	Chassis HS-554 is electrically identical to chassis HS-483 except for the following changes. COMPONENT CHANGES X2, 1st IF Amplifier, is changed from a 2N146 to a 2N145, part #48C124220. X3, 2nd IF Amplifier, is changed from a 2N146 to a 2N145, part #48C124220. L2, oscillator coil, is changed to part #24K636690. A germanium diode, part #48K636691, is added from terminal 5 of L2 to the junction of R2 and R3. R7 is omitted and replaced with a jumper wire. R11 is decreased from 4700Ω to 2200Ω. R13 is omitted and replaced with a jumper wire. R18 is decreased from 120Ω to 82Ω.

MOTOROLA MODELS 56T1, 56T1A, 56T1B (Ch. HS-483, HS-553, HS-554)

PRODUCTION CHANGES
BULLETIN 183

PRODUCTION CHANGES
BULLETIN 183

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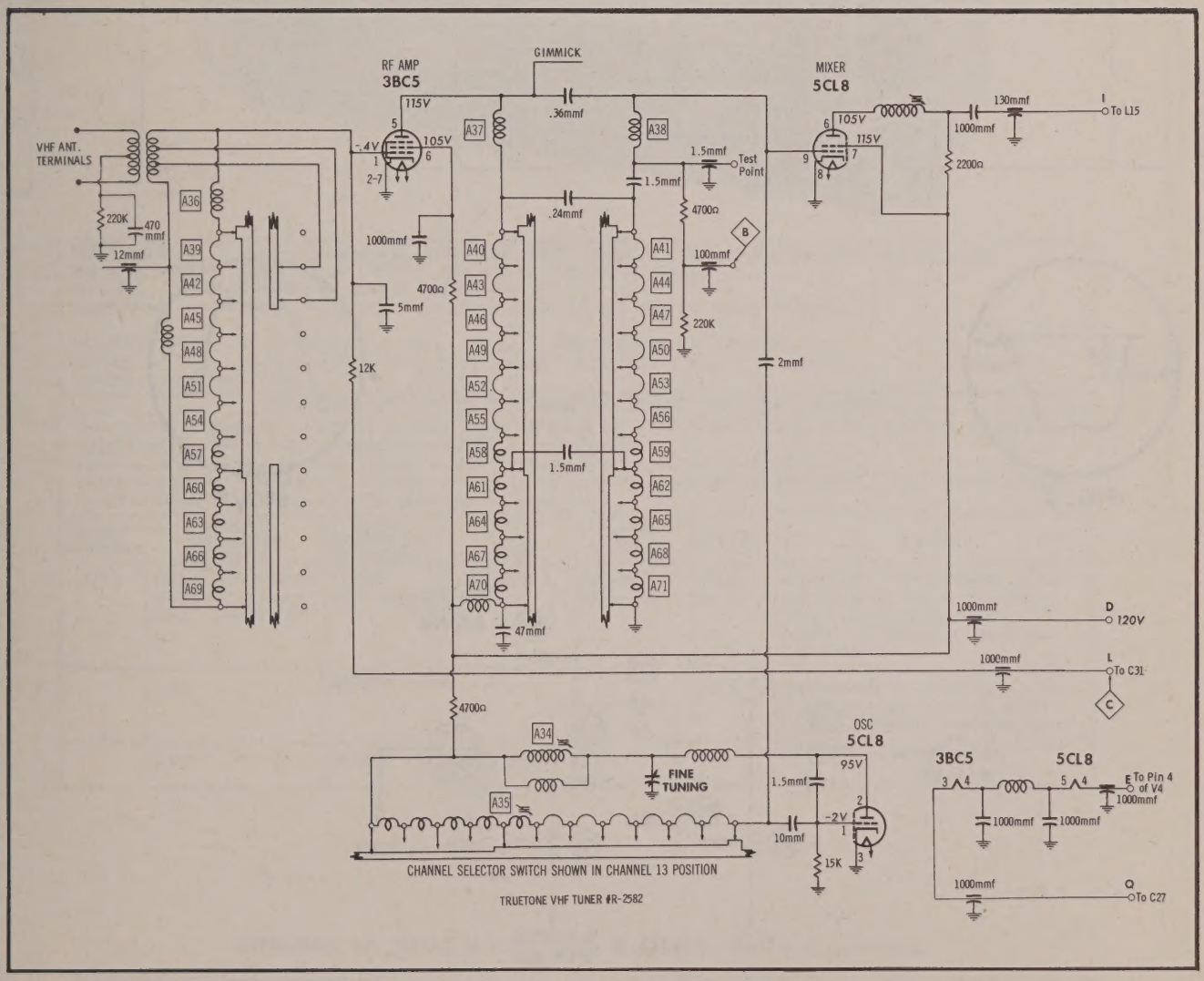
SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 1 IN SET 347		AIRLINE MODEL GRX4020B
	Airline Models GRX4020A and GRX4120A were covered in Photofact Folder 1 - Set 347. Model GRX4020B is electrically identifcal to model GRX4020A except for the following change.	
	NEW TUNER A new VHF Tuner, part #R-2582 is used in model GRX4020B. A schematic along with complete alignment procedure is given in this bulletin.	



ALIGNMENT INSTRUCTIONS

OSCILLATOR ALIGNMENT

Attempt this alignment only with proper test equipment and set up.
Connect the negative lead of a 3 volt bias supply to point Ⓒ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 47K to point Ⓐ. Low side to chassis. See Fig. 8 for location of point Ⓐ.	A34	Adjust to place sound marker in trap notch as in Fig. 7. Video marker should fall at 50%.
18.	"	"	85MC (10MC Swp)	83. 25MC 87. 75MC	6	"	A35	"

RF AND MIXER ALIGNMENT

Connect the bias as under "Oscillator Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
19.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 47K to point Ⓑ. Low side to chassis.	A36, A37, A38	Adjust to obtain a flat response with maximum gain as in Fig. 9. Spreading the coils increases the frequency and compressing the decreases the frequency. A tuning wand may be used to determine what change is necessary.
			207MC (10MC Swp)	205. 25MC 209. 75MC	12		A39, A40, A41,	
			201MC (10MC Swp)	199. 25MC 203. 75MC	11		A42, A43, A44,	
			195MC (10MC Swp)	193. 25MC 197. 75MC	10		A45, A46, A47,	
			189MC (10MC Swp)	187. 25MC 191. 75MC	9		A48, A49, A50,	
			183MC (10MC Swp)	181. 25MC 185. 75MC	8		A51, A52, A53,	
			177MC (10MC Swp)	175. 25MC 179. 75MC	7		A54, A55, A56	
			85MC (10MC Swp)	83. 25MC 87. 75MC	6		A57, A58, A59	
			79MC (10MC Swp)	77. 25MC 81. 75MC	5		A60, A61, A62	
			69MC (10MC Swp)	67. 25MC 71. 75MC	4		A63, A64, A65	
			63MC (10MC Swp)	61. 25MC 65. 75MC	3		A66, A67, A68	
			57MC (10MC Swp)	55. 25MC 59. 75MC	2		A69, A70, A71	

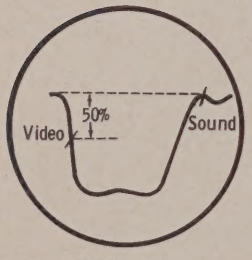


FIG. 7

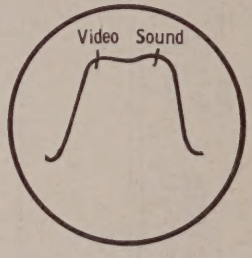


FIG. 9

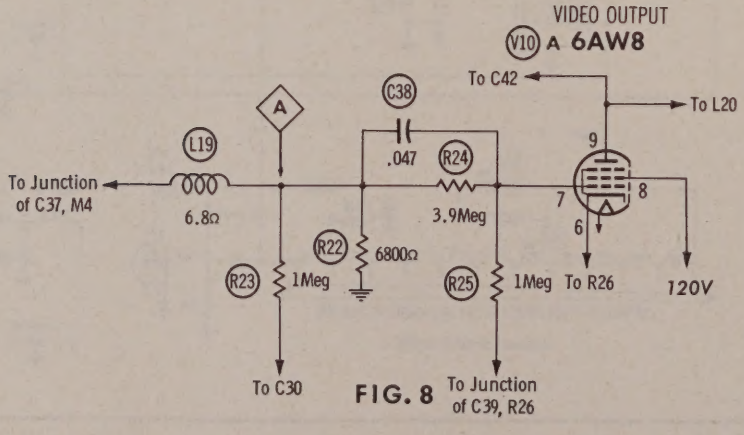


FIG. 8

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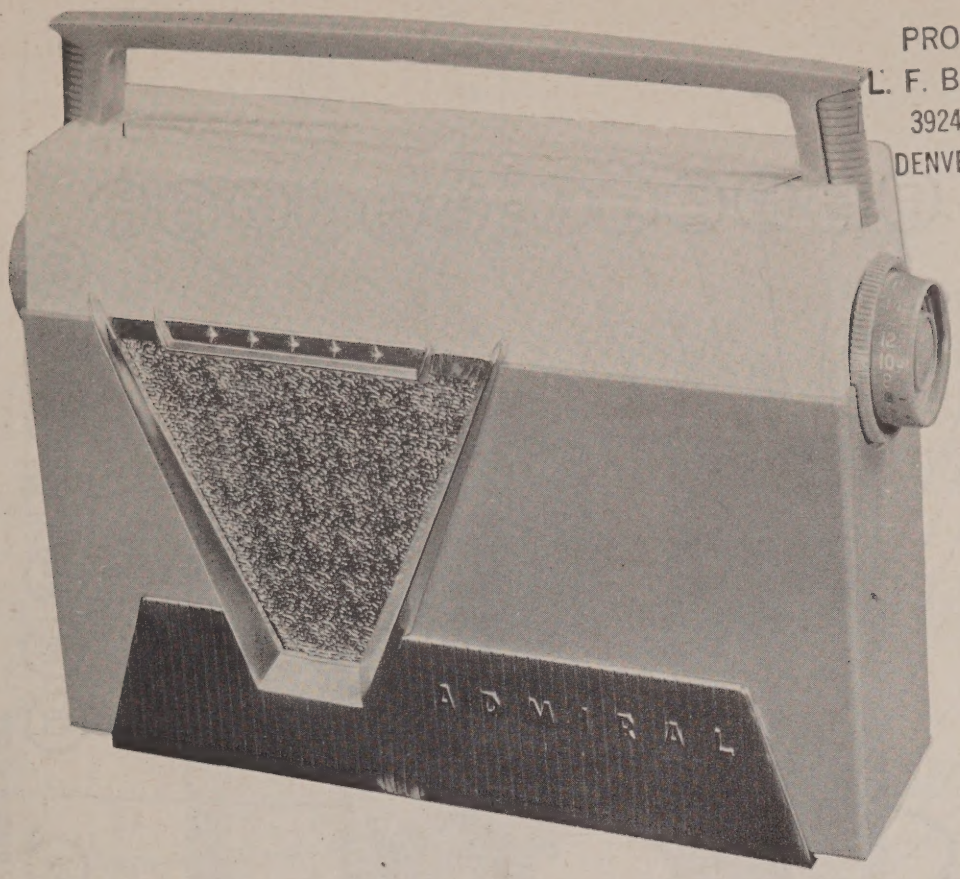
ADMIRAL
CHASSIS 4E2, 4H2



ADMIRAL
CHASSIS 4E2, 4H2

TRADE NAME	Admiral Models 4E21, 4F22, 4F24, 4F26, 4F28 (Ch. 4E2), 4H22, 4H24, 4H26, 4H28 (Ch. 4H2)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois
TYPE SET	Three Power Portable AM Receiver
TUBES (Four)	Types 1R5 Converter, 1U4 IF Amplifier, 1U5 Det.-AVC-AF Amp., 3V4 Output.
POWER SUPPLY RATING	110-120 Volts AC-DC (Or) 7.5 Volts "A" Supply & 90 Volts "B" Supply .16 Amp. @ 117 Volts AC (Or) 55MA @ 7.5 Volts DC & 7MA @ 90 Volts DC
TUNING RANGE—BROADCAST	535KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to antenna stator lug on tuning gang. Low side to B-.	455KC (400~ mod.)	Tuning gang fully open.	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1400KC	Tune to 1400KC signal.	"	A6	"

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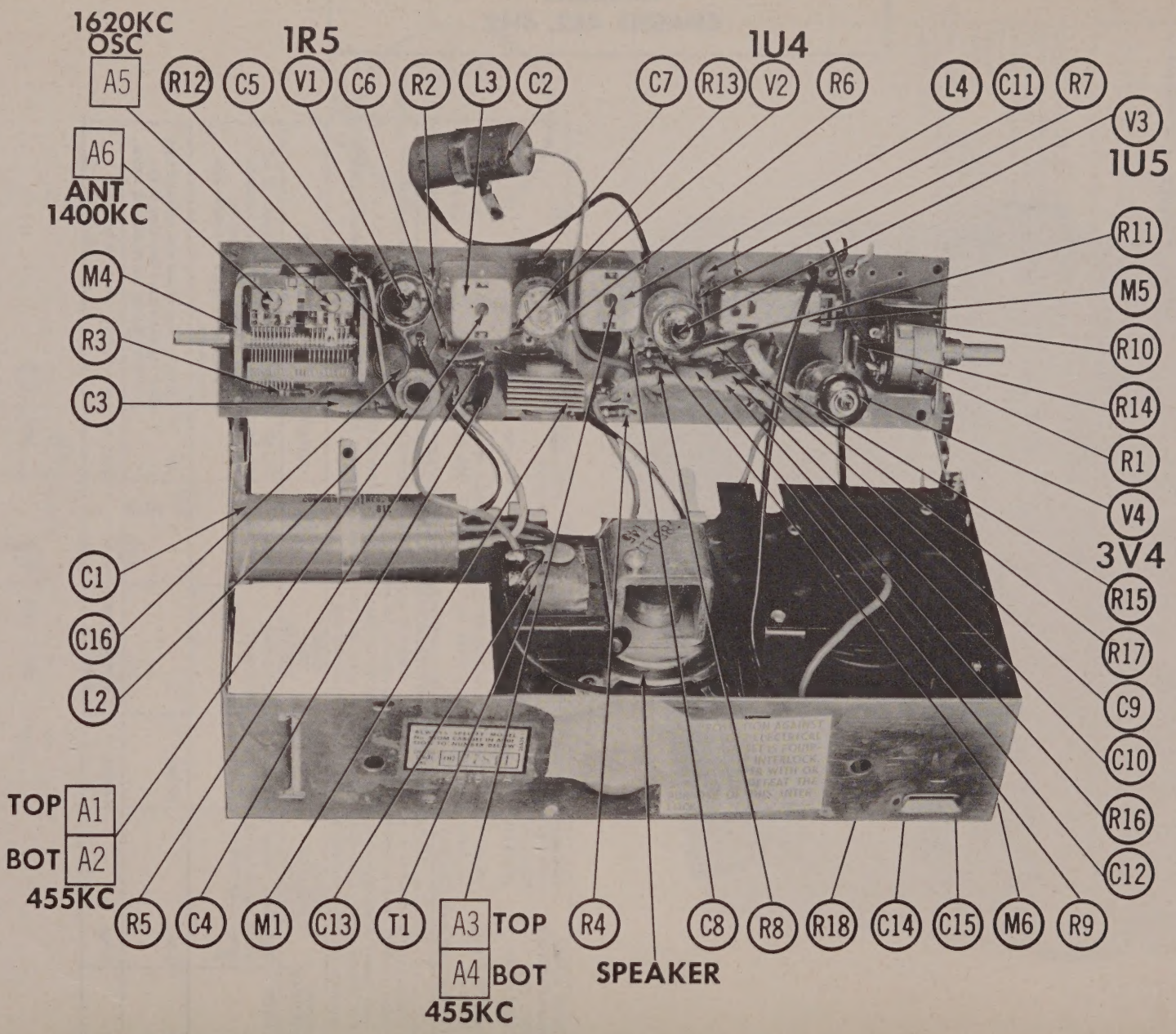


CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	1R5	
V2	IF Amplifier	1U4	
V3	Det. -AVC-AF Amplifier	1U5	
V4	Output	3V4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	67B23-4	PR4-800	C0100	TCT3118		CST-1540	R1635 *
B	40	150						MT-1540	
C	40	150							
C2	200	10	67A18-5	PRS12V250	BR2501	TC1502	TD-250-15	MTH-1225	TVA-1131

* Non Catalog Item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	10000		65D10-3	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C4	10000		65D10-41	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C5	50		65D10-80	BPD-00005	DD-500	L10Q5	ED-50	UC-545	5GA-Q5	
C6	10000		65D10-3	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C7	5000		65D10-1	BPD-005	DD-502	BYA6D5	ED-005	DC525	5HK-D5	
C8	220		65D10-21	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C9	10000		65D10-3	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C10	150		65D10-85	N750-S1150	TCN-150	C10T15U	TC7-150		5TCU-T15	
C11	2000		65C10-39	BPD-002	DD-203	BYA10D2	ED-002	DC522	5HK-D2	
C12	5000		65D10-1	BPD-005	DD-502	BYA6D5	ED-005	DC525	5HK-D5	
C13	2000	1000	65D10-39			BYA10D2				
C14	.047	400	64B17-28	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C15	.15	400	64A3-15	P488N-15		CUB4P15		GEM-4015	4TM-P15	
C16	.25	25	64B23-2							

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	1Meg	½	75C25-4					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ADMIRAL PART No.	IRC PART No.	
R2	100K		60B8-104	BTS-100K	
R3	15K		60B8-153	BTS-15K	
R4	3.3Meg		60B8-335	BTS-3.3Meg	
R5	10Meg		60B8-106	BTS-10Meg	
R6	6800Ω		60B8-682	BTS-6800	
R7	10Meg		60B8-106	BTS-10Meg	
R8	1Meg		60B8-105	BTS-1Meg	
R9	4.7Meg		60B8-475	BTS-4.7Meg	
R10	3.3Meg		60B8-335	BTS-3.3Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ADMIRAL PART No.	IRC PART No.	
R11	120Ω		60B8-121	BTS-120	
R12	180Ω		60B8-181	BTS-180	
R13	220Ω		60B8-221	BTS-220	
R14	1500Ω		60B8-152	BTS-1500	
R15	1400Ω	4	61A4-6		
R16	840Ω	6	61A4-7		Note 3.
R17	1500Ω	2	60B20-152	BTB-1500	Note 2.
R18	100Ω		61A11-4		Note 1.

Note #1. 22Ω used in early productions (Part #61A11-3).
Note #2. 2700Ω, 1W used in early productions (Part #60B14-272).
Note #3. 1380Ω, 6W used in early productions (Part #61A4-5). 1380Ω 6W & 2200Ω 2W may be used in parallel in late production

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	9000Ω	3-4Ω	79C33-8	Z1116 ①	A-2932 ①	A-3879 ①	24S52 ①	S-17X ①	① Bend Ears Down.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ADMIRAL PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	78B117-1 ①	4A07	① Includes T1.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	69B210				
L2	Osc. Coil	69A211-1				
L3	Input IF	72C170-1	16-6780	BC-356	13PC1	
L4	Output IF	72C170-1	16-6780	BC-357	13PC2	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	ADMIRAL PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.060A	93B1-11	1003A	RS075	6S75	5M4	75	

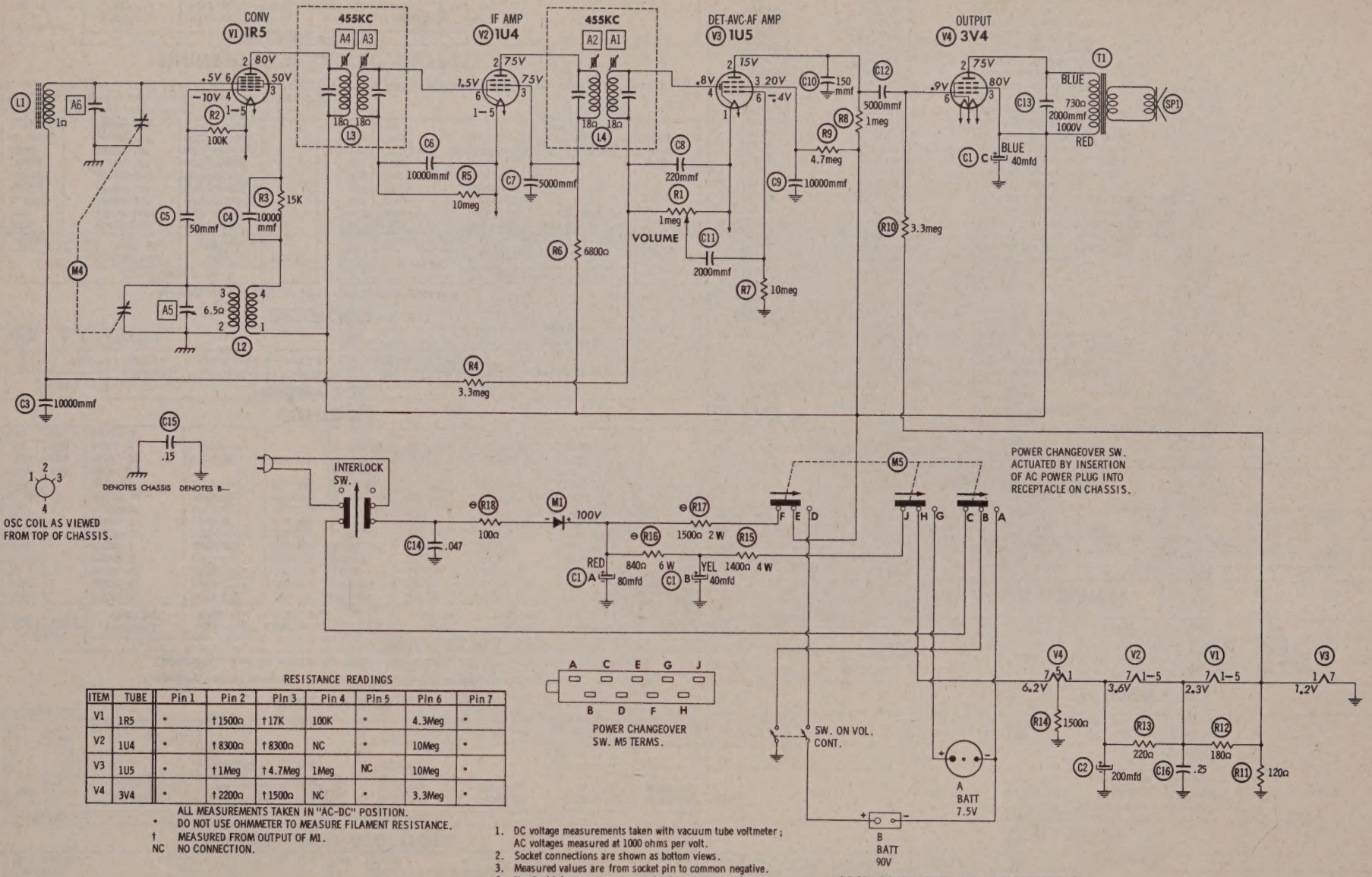
BATTERIES

ITEM No.	VOLTAGE	ADMIRAL PART No.	REPLACEMENT DATA								
			BURGESS			EVEREADY			MALLORY		
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	"A"	"B"	"A-B"
M2	71/2V		C5			717			M9		
M3	90V			P60			479			M214	

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M4	Tuning Cap	68B66-1	Two Gang
M5	Switch	77B64	Power Changeover
M6	Switch	77A61	Interlock
	Printed Board	14E185	
	Cover	33D180-1	Top, Antenna, Charcoal
	Cover	33D180-3	Top, Antenna, White
	Cover	33D180-2	Bottom, Antenna, Charcoal
	Cover	33D180-4	Bottom, Antenna, White
	Handle	33B177-1	Charcoal
	Handle	33B177-2	Red
	Handle	33B177-3	Tan
	Handle	33B177-4	Turquoise
	Handle	33B177-6	Yellow
	Knob	33C186	Cabinet Locking
	Knob	33C183-1	On-Off-Volume, Model 4E21
	Knob	33C183-3	On-Off-Volume, Model 4F22, 4H22
	Knob	33C183-5	On-Off-Volume, Model 4F24, 4H24
	Knob	33C183-7	On-Off-Volume, Model 4F28, 4H28
	Knob	33C183-11	On-Off-Volume, Model 4F26, 4H26
	Knob	33C183-2	Tuning, Model 4E21
	Knob	33C183-4	Tuning, Model 4F22, 4H22
	Knob	33C183-6	Tuning, Model 4F24, 4H24
	Knob	33C183-8	Tuning, Model 4F28, 4H28
	Knob	33C183-12	Tuning, Model 4F26, 4H26
	Cabinet	34E104-17	Bottom, Model 4E21
	Cabinet	34E104-18	Bottom, Model 4F22
	Cabinet	34E104-3	Bottom, Model 4H22
	Cabinet	34E104-20	Bottom, Model 4F24
	Cabinet	34E104-5	Bottom, Model 4H24
	Cabinet	34E104-24	Bottom, Model 4F28
	Cabinet	34E104-7	Bottom, Model 4H28
	Cabinet	34E104-22	Bottom, Model 4F26
	Cabinet	34E104-16	Bottom, Model 4H26
	Cabinet	34E104-35	Cover, Model 4E21
	Cabinet	34E104-36	Cover, All Models Except Model 4E21

SET 354 FOLDER 2



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	1R5	•	†1500Ω	†17K	100K	•	4.3Meg	•
V2	1U4	•	†8300Ω	†8300Ω	NC	•	10Meg	•
V3	1U5	•	†1Meg	†4.7Meg	1Meg	NC	10Meg	•
V4	3V4	•	†2200Ω	†1500Ω	NC	•	3.3Meg	•

ALL MEASUREMENTS TAKEN IN "AC-DC" POSITION.
• DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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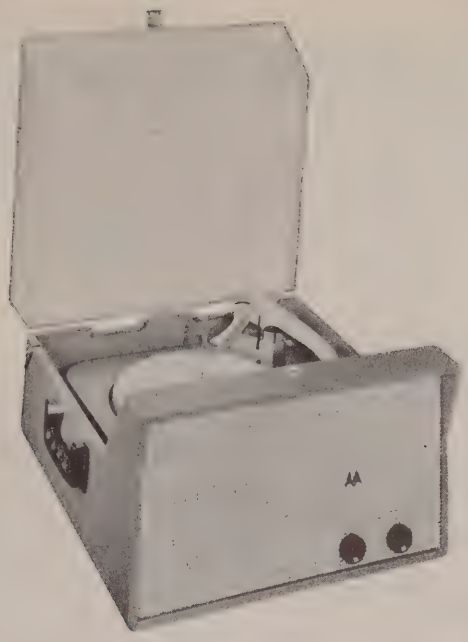
MOTOROLA
MODEL 36F1, 36F1C (Ch. HS-496)



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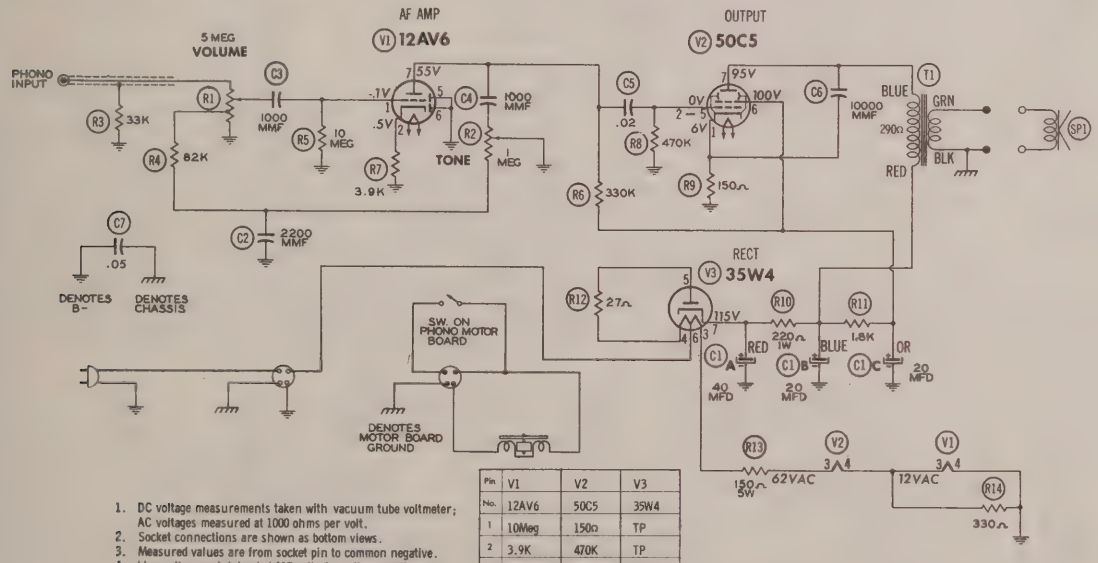
DENVER, COLORADO

MOTOROLA
MODEL 36F1, 36F1C (Ch. HS-496)

TRADE NAME	Motorola Models 36F1, 36F1C (Ch. HS-496)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Ill.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Automatic Record Changer
TUBES (Three)	Types 12AV6 AF Amplifier, 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING .23 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER USED IN MODEL 36F1 - SEE SIMILAR CRESCENT 500 SERIES - PHOTOFACT SET 197 - FOLDER 4 OR RECORD CHANGER MANUAL CM-5.
FOR SERVICE INFORMATION ON RECORD CHANGER USED IN MODEL 36F1C - SEE SIMILAR V-M MODEL 954B - PHOTOFACT SET 302 - FOLDER 12.



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Pin No.	V1 12AV6	V2 50C5	V3 35W4
1	10Meg	150Ω	TP
2	3.9K	470K	TP
3	12Ω	62Ω	212Ω
4	0Ω	12Ω	247Ω
5	0Ω	NC	275Ω
6	0Ω	†2K	242Ω
7	†330K	†500Ω	8K

† MEASURED FROM PIN 7 OF V3.
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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354-12

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AV6	
V2	Output	50C5	
V3	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150	23B484234	PRS150V40-20-20	BBRT42215	TCT3114	TDLT-3	FMT-310	TVA-3448
B	20	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	2200		21K121882	BPD-0022	DD-222	K073	811-0022	DC522	5HK-D22	
C3	1000		21A121678	BPD-001	DD-102	K069	801-001	DC511	5HK-D1	
C4	1000		21A121678	BPD-001	DD-102	K069	801-001	DC511	5HK-D1	
C5	.02	200	8R121003	BPD-02	DF-203	CUB2S2	817-02	PT412	2TM-S2	
C6	10000		21R482726	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C7	.05	200	8R121005	BPD-05	DF-503	CUB2S5		PT415	2TM-S5	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	5Meg	½	18A632189					Volume Tapped ② 1.5Meg
R2	1Meg	½	18A632190	B-68		Q14-137	U-54	Tone

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	MOTOROLA PART No.	IRC PART No.	NOTES
R3	33K		6R6012	BTS-33K	
R4	82K		6R5644	BTS-82K	
R5	10Meg		6R2109	BTS-10Meg	
R6	330K		6R6014	BTS-330K	
R7	3900Ω		6R5659	BTS-3900	
R8	470K		6R6032	BTS-470K	
R9	150Ω		6R6373	BTS-150	
R10	220Ω	1	6R6173	BTA-220	
R11	1800Ω		6R2089	BTS-1800	
R12	27Ω		6R5683	BTS-27	
R13	150Ω 5%	5	17A632208		
R14	330Ω		6R6010	BTS-330	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2.4K	3-4Ω	25C634434-B	Z1001 ①	A-2902	A-3849	26S50	S-1X ①	① Drill one new mtg. hole.

SPEAKER

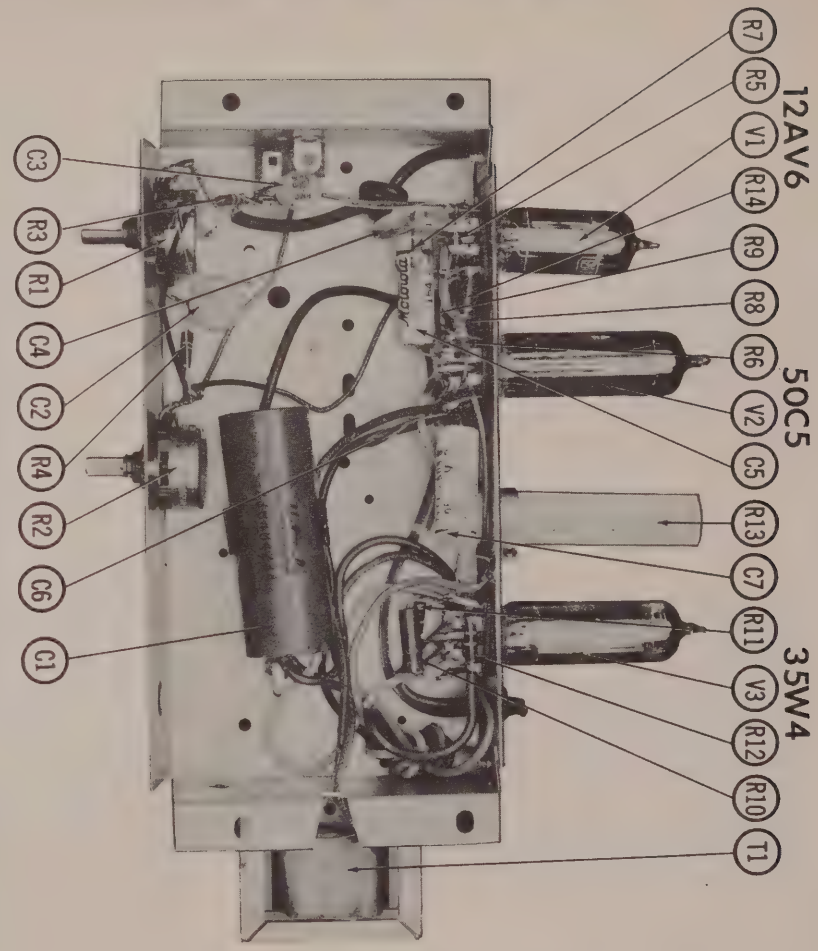
ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	NOTES
SP1	5 1/4"	PM	3-4Ω	50C632787	52A1	

PHONO CARTRIDGE

ITEM No.	MOTOROLA PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. MOUNT	REMARKS
M1	720022	55-T	GD-J	56	PT-2	

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

CHASSIS—BOTTOM VIEW



PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	MOTOROLA PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2		*S-67 or †S-66 or ♦†S-66SD or ♦S-66D	†W-75TPS or ♦†W-75DS or ♦W-75TPD	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
	Cabinet	16E634478	
	Handle	55K632670	Carrying
	Knob	36B634492	Volume & Tone

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3924 MEADE ST.
DENVER, COLORADO

COLUMBIA RECORDS
MODEL 420

TRADE NAME	Columbia Records Model 420
MANUFACTURER	Columbia Records, 799 Seventh Ave., New York 19, N.Y.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Automatic Record Changer
TUBES (Three)	Types 12AU6 AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC - 60 Cycles RATING .24 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR V-M MODEL 950 - PHOTOFACT SET #216 - FOLDER #11 OR RECORD CHANGER MANUAL CM-5.

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PARTS LIST AND DESCRIPTIONS

COLUMBIA RECORDS
MODEL 420

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp.	12AU6	
V2	Audio Output	50C5	
V3	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Columbia Records PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150		PRS150V80-40-20	BBRT84215	TCT3117	TDLT-7	MTD-303 MT-1520	TVA-3455
B	80	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Columbia Records PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.047	200		BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C3	.0047	400		SI 4700	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C4	.047	200		BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C5	100	500		NP0-SI 100	TCZ-100	5R5T1	NP0-337-101	MCB235	MS-31	
C6	.01	400		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C7	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C8	.047	200		BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C9	.047	200		BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C10	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Columbia Records PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	5Meg	½		AB-87	A47-5Meg-S	Q11-141	U-67	Bass
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
R2A	3.25Meg	½		ABT-8515			UT-461	Loudness, Tap @ 250K
B	Shaft			AK-4			Not Req.	
R3A	7500Ω	½		AB-13	A47-7500-S	Q11-115	U-20	Treble
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	

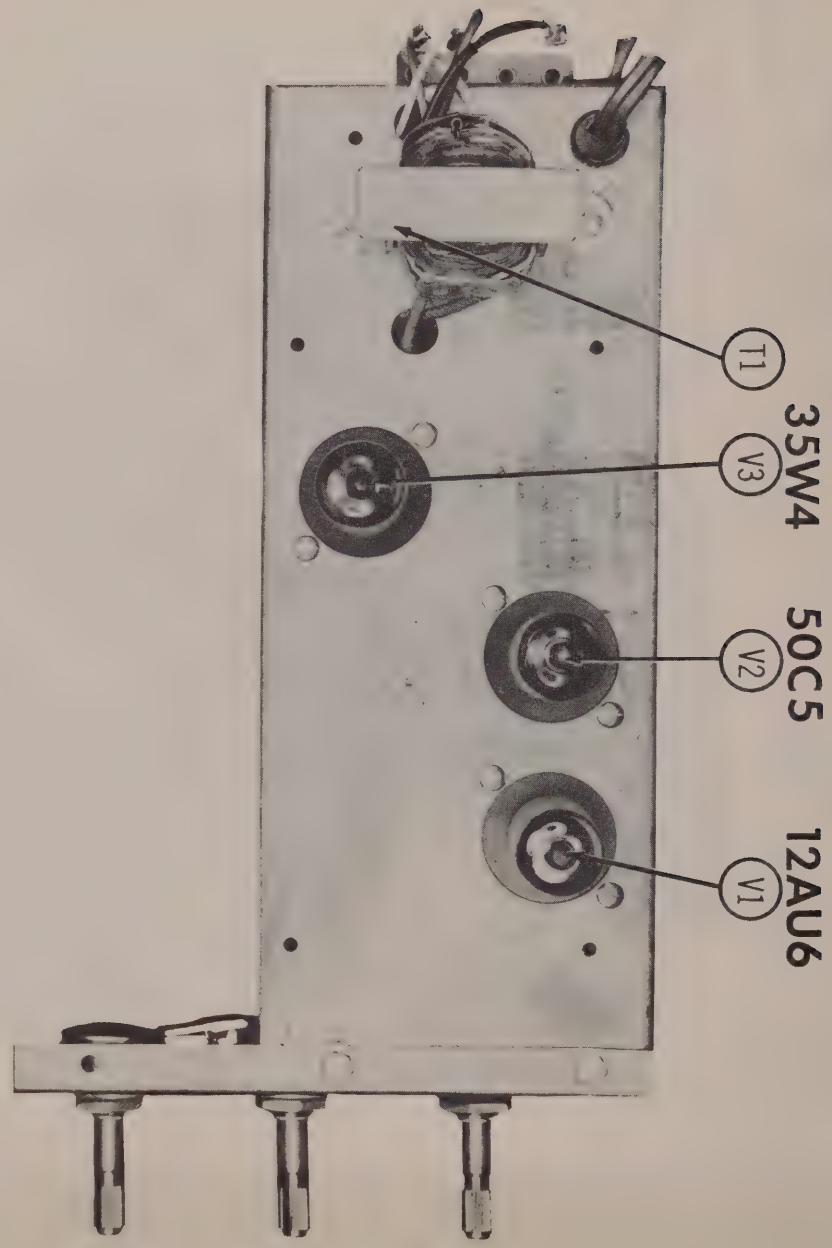
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Columbia Record PART No.	IRC PART No.	
R4	100K			BTS-100K	
R5	47K			BTS-47K	
R6	2.2Meg			BTS-2.2Meg	
R7	220K			BTS-220K	
R8	1Meg			BTS-1Meg	
R9	3300Ω			BTS-3300	
R10	2200Ω			BTS-2200	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Columbia Records PART No.	IRC PART No.	
R11	470K			BTS-470K	
R12	150K			BTS-150K	
R13	10K			BTS-10K	
R14	330Ω	2		BTB-330	
R15	22Ω	1		BTA-22	
R16	130Ω	5		PW7-150	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Columbia Records PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.3K	1.6Ω	TR-112	Z1001	A-2902	A-3849①			① Drill one new mtg. hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Columbia Records PART No.	QUAM PART No.	
SP1	6"	PM	3.2Ω	SP-67	6A1	
SP2	6"	PM	3.2Ω	SP-67	6A1	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	Columbia Records PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M1		112-TS	A-1 & A-3	56	PT-1	

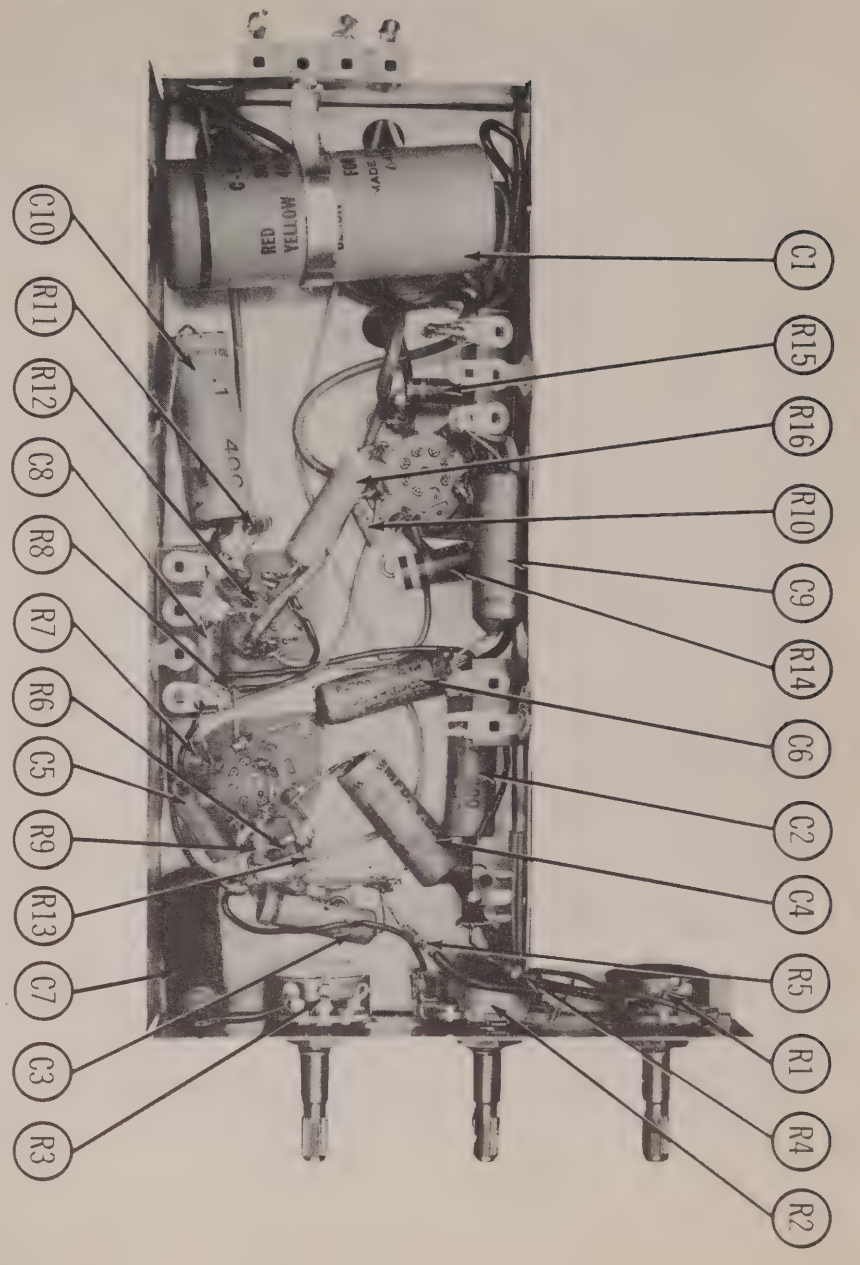
ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

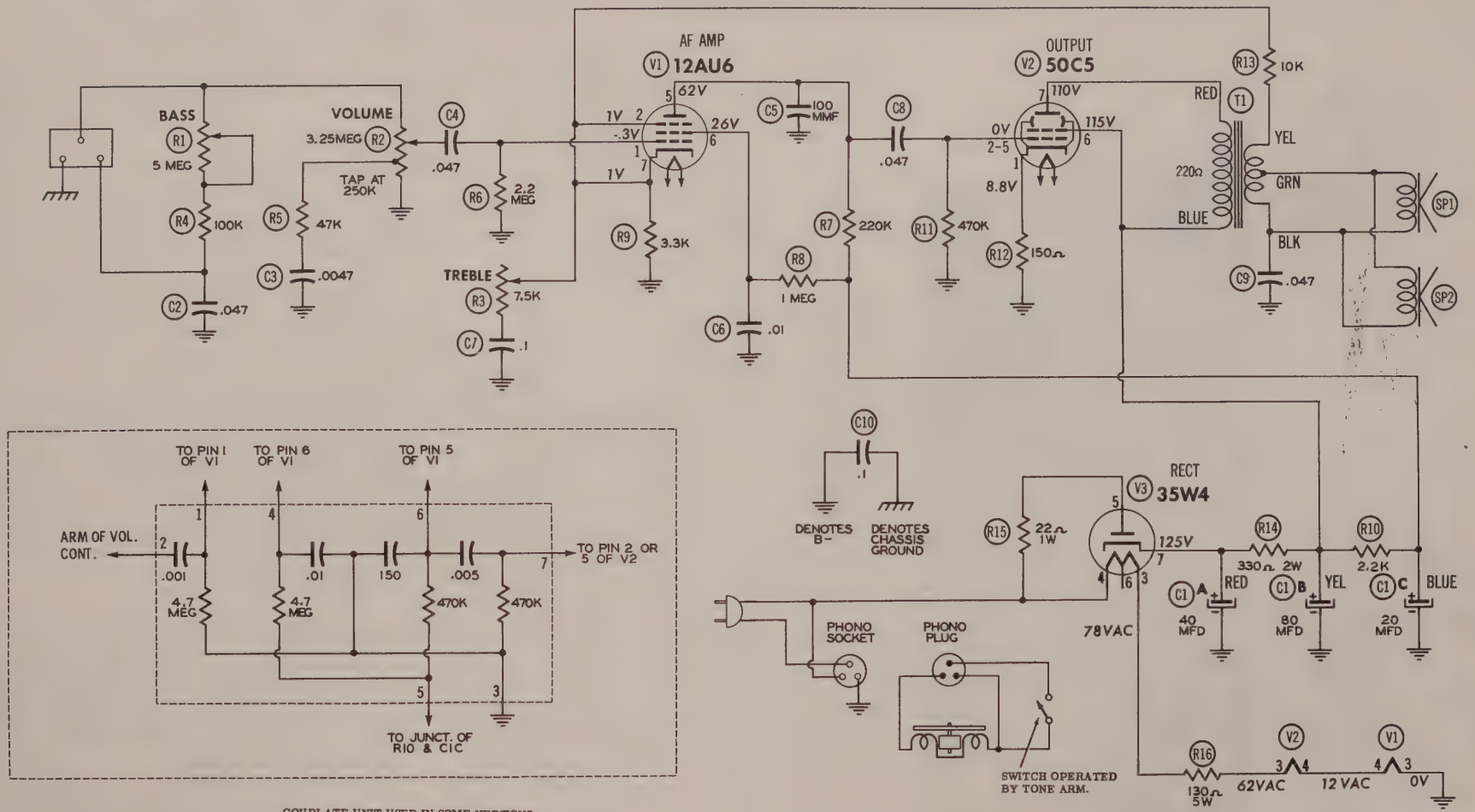
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	Columbia Records PART No.	JENSEN PART No.	WALCO PART No.	
M2		†CR-55 or ♦CR-55D and †CR-55LP or ♦CR-55LPD	†W-64S and †W-64MGS	† Jewel ♦ Diamond

CHASSIS—BOTTOM VIEW



COLUMBIA RECORDS
MODEL 420



COUPLATE UNIT USED IN SOME VERSIONS.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AU6	2.2Meg	3.3K	0Ω	12Ω	†222K	†1Meg	3.3K
V2	50C5	150Ω	470K	62Ω	12Ω	470K	†330Ω	†550Ω
V3	35W4	TP	TP	192Ω	227Ω	249Ω	222Ω	60K

† MEASURED FROM PIN 7 OF V3.
TP TIE POINT

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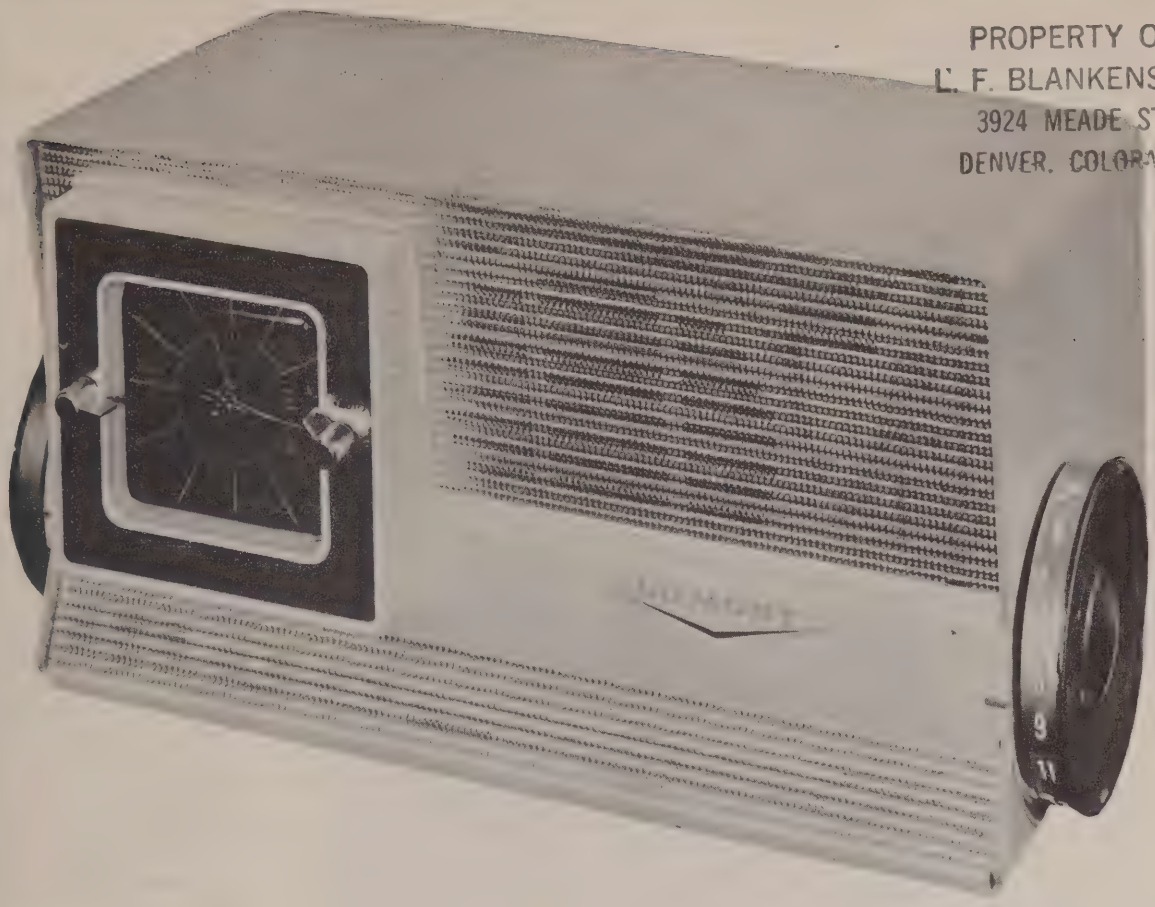
DUMONT
MODELS 1110, 1120, 1130, 1140, 1150



DUMONT
MODELS 1110, 1120, 1130, 1140, 1150

TRADE NAME	Dumont Models 1110, 1120, 1130, 1140, 1150
MANUFACTURER	Allen B. Dumont Laboratories Inc., 2 Main St., Passaic, N.J.
TYPE SET	AC Operated AM Receiver (Models 1140 & 1150 Are Clock Versions)
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AT6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles
RATING	.3 Amp. @ 117 Volts AC (26 Watts Without Clock)
TUNING RANGE—BROADCAST	540KC - 1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4,	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1650KC	"	"	A5	"
3.		"	1420KC	Tune to 1420KC signal.	"	A6	"

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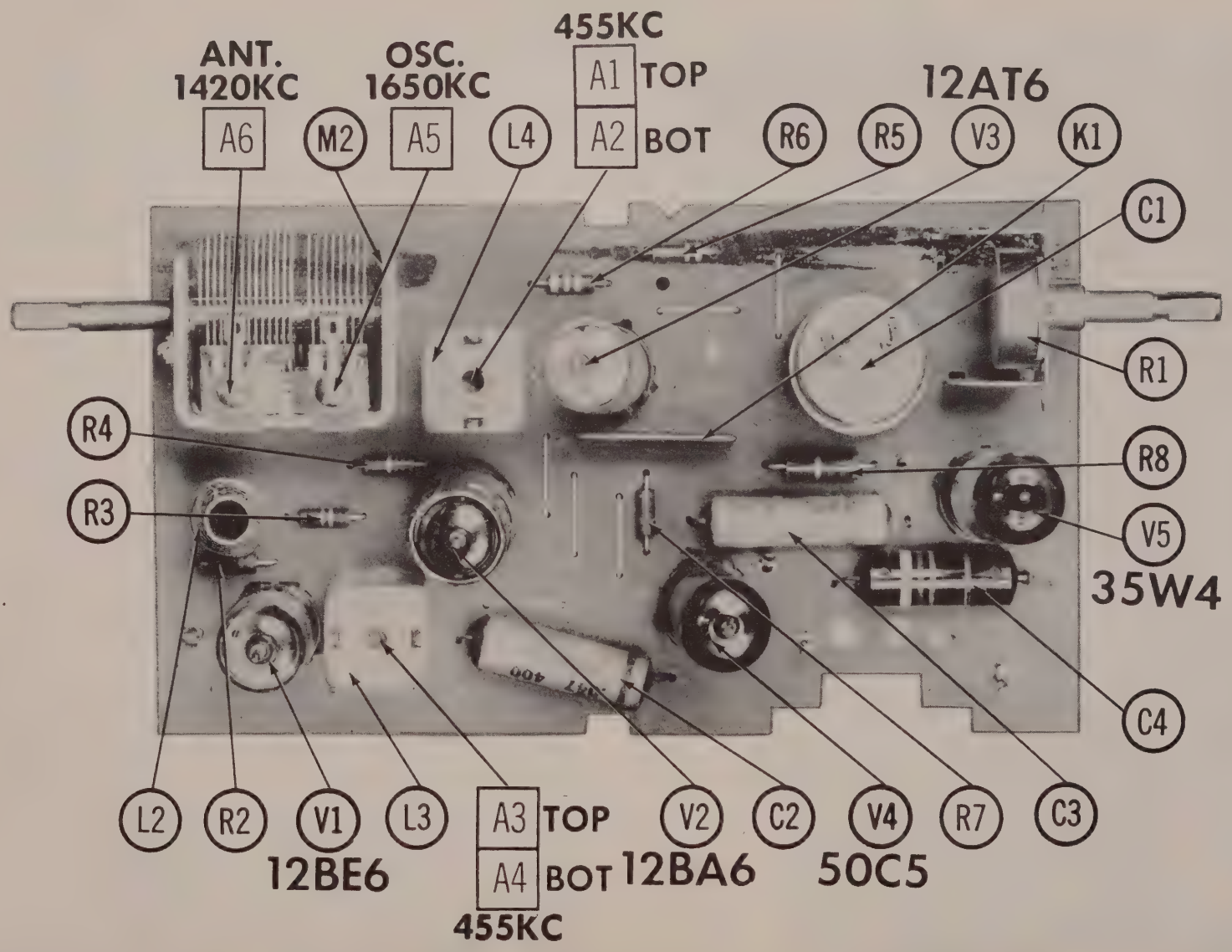


CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det-AVC-AF Amp.	12AT6	

ITEM No.	USE	TYPE	NOTES
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DUMONT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■70	150	03190021	AFH2-19	XB0181	FP216	TMD-16	D-085	TVL-2439
B	▲30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	DUMONT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.047	400	03141100	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C3	.022	400	03141080	BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C4	.047	400	03127600	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DUMONT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	500K	½	01071171					Volume (Note 1)

Note 1: Part #01068371 used in model 1110.
Part #01068381 used in model 1120.
Part #01068391 used in model 1130.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DUMONT PART No.	IRC PART No.	
R2	22Ω		02032320	BTS-22	
R3	22K		02031930	BTS-22K	
R4	180Ω		02031680	BTS-180	Note 1
R5	3.3Meg		02032630	BTS-3.3Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DUMONT PART No.	IRC PART No.	
R6	47K		02032520	BTS-47K	
R7	150Ω		02032370	BTS-150	
R8	1200Ω	1	02034780	BTA-1200	

Note 1: 150Ω used in model 1130 (Part #02032370).

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DUMONT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2500Ω	3-4Ω	Part of speaker	Z1101	A-3025	A-3332	26S58 ①	S-12X	① Drill new mtg. hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	DUMONT PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	18004021 ①②	4A07	① Includes T1.
	4"	PM		18003991 ①③		② Used in model 1140.
	4"	PM		18004001 ①④		③ Used in model 1110.
	4"	PM		18004011 ①⑤		④ Used in models 1120, 1150.
	4"	PM		18004012 ⑤		⑤ Used in model 1130.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		DUMONT PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	32005721				Model 1140 (Note 1)
L2	Osc. Coil	21015641				Models 1110, 1120, 1140, 1150 (Note 2)
L3	Input IF	20011101				
L4	Output IF	20011101				

Note 1: Cabinet back included. Part #32005701 used in model 1120.
Part #22001671 used in model 1130.
Part #32005731 used in model 1150.

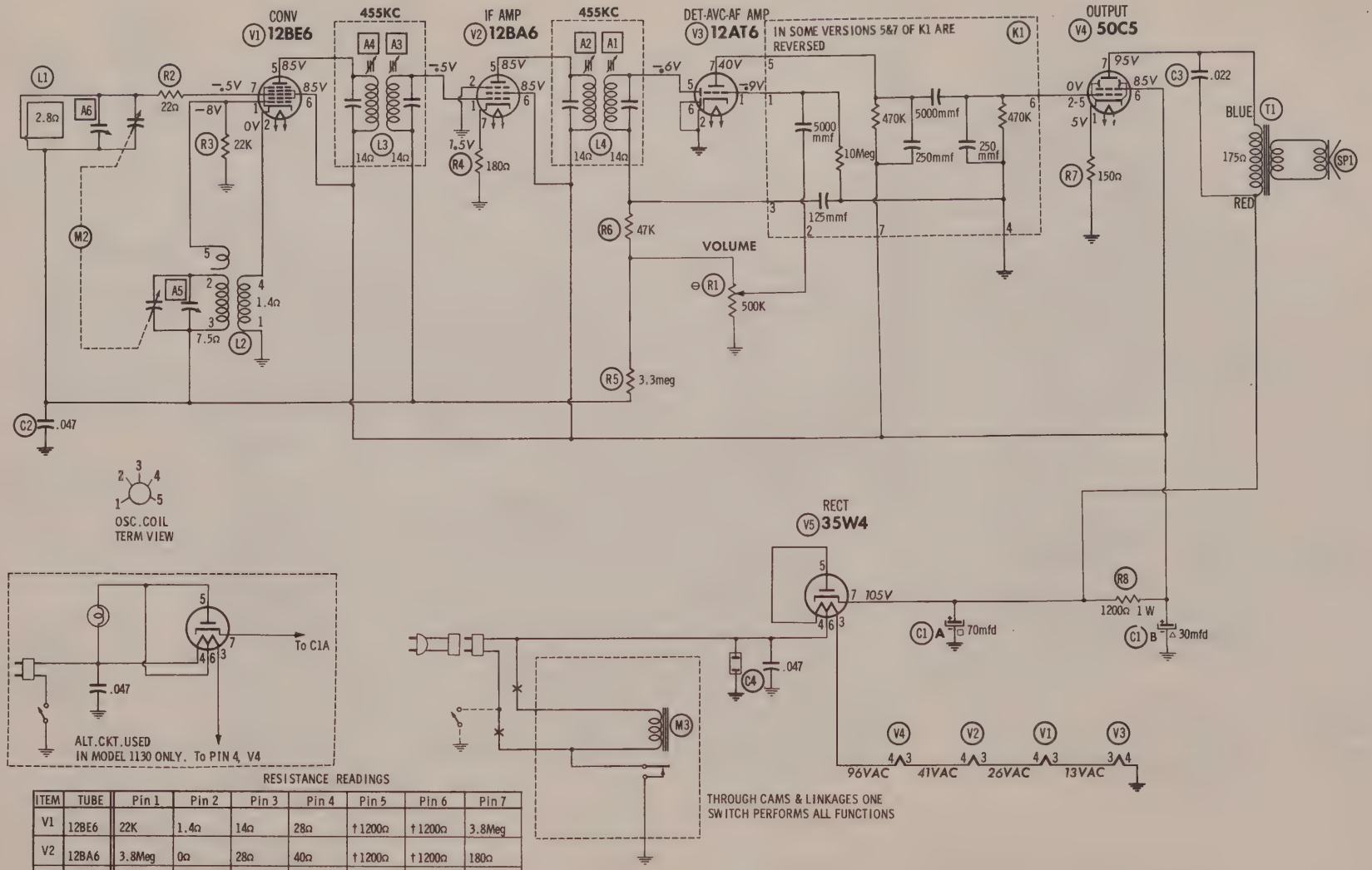
Note 2: Part #21015651 used in model 1130.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	DUMONT PART No.	REPLACEMENT DATA
K1	Det. -Audio Net.	5000MMF, 125MMF, 250MMF, 250MMF, 5000MMF, 10Meg, 470K, 470K	88001791	

MISCELLANEOUS

ITEM No.	PART NAME	DUMONT PART No.	NOTES
M1	Dial Light	12001310	Model 1130
M2	Tuning Cap.	03190011	Two Gang. Part #03250491 used in Model 1130, Part #03250481 used in models 1110, 1120, 1150.
M3	Clock	28002141	Model 1140.
	Clock	28002151	Model 1150.
	Printed Board	88001781	Models 1110, 1120, 1140, 1150.
	Printed Board	88001791	Model 1130
	Crystal	45007801	Clock, Models 1140, 1150
	Glass	45007781	Dial, Model 1130
	Pointer	45007771	Dial, Model 1130
	Knob	45007731	Tuning, Model 1140
	Knob	45007732	Volume, Model 1140
	Knob	45007751	Clock Control, Model 1140
	Knob	45007752	Clock Control, Model 1140
	Knob	45077701	Tuning, Ivory, Models 1150, 1110
	Knob	45007702	Tuning, Ebony, Models 1150, 1110
	Knob	45007708	Tuning, Red, Model 1150
	Knob	45007714	Volume, Ivory, Model 1150
	Knob	45007715	Volume, Ebony, Model 1150
	Knob	45007716	Volume, Red, Model 1150
	Knob	45007761	Clock Control, Model 1150
	Knob	45007721	Tuning, Ivory, Model 1130
	Knob	45007722	Tuning, Charcoal, Model 1130
	Knob	45007723	Tuning, Pink, Model 1130
	Knob	45007724	Volume, Ivory, Model 1130
	Knob	45007725	Volume, Charcoal, Model 1130
	Knob	45007726	Volume, Pink, Model 1130
	Knob	45007705	Tuning, Ivory, Model 1120
	Knob	45007706	Tuning, Turquoise, Model 1120
	Knob	45007707	Tuning, Sand, Model 1120
	Knob	45007711	Volume, Ivory, Model 1120
	Knob	45007712	Volume, Turquoise, Model 1120
	Knob	45007713	Volume, Sand, Model 1120
	Knob	45007703	Tuning, Red, Model 1110
	Knob	45007704	Tuning, Green, Model 1110
	Knob	45007741	Volume, Ivory, Model 1110
	Knob	45007742	Volume, Ebony, Model 1110
	Knob	45007743	Volume, Red, Model 1110
	Knob	45007744	Volume, Green, Model 1110



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	1.4Ω	14Ω	28Ω	†1200Ω	†1200Ω	3.8Meg
V2	12BA6	3.8Meg	0Ω	28Ω	40Ω	†1200Ω	†1200Ω	180Ω
V3	12AT6	10Meg	0Ω	14Ω	0Ω	550K	0Ω	†470K
V4	50C5	150Ω	470K	40Ω	90Ω	470K	†1200Ω	†175Ω
V5	35W4	NC	NC	90Ω	125Ω	125Ω	120Ω	50K

† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

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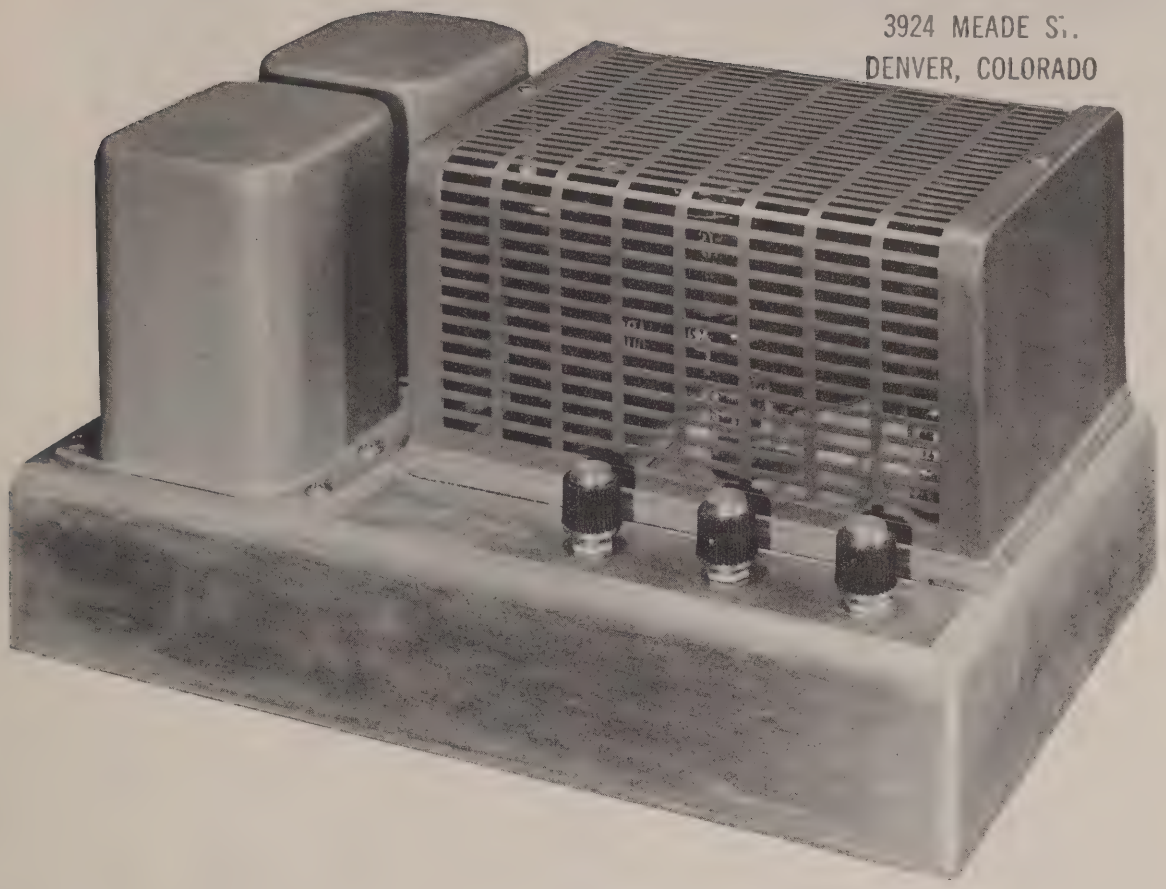
ELECTRO-VOICE
MODEL A30



ELECTRO-VOICE
MODEL A30

TRADE NAME	Electro-Voice Model A30
MANUFACTURER	Electro-Voice, Inc., Buchanan, Michigan
TYPE SET	AC Operated 30 Watt Audio Amplifier
TUBES (Six)	Types 12AX7 AF Amp.-Phase Inv., 12BH7A Driver, (2) 1614 Output, (2) 5Y3GT Rectifier
POWER SUPPLY	105-125 Volts AC - 60 Cycles RATING 1 Amp. @ 117 Volts AC (110 Watts)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

ELECTRO-VOICE MODEL A30

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. -Phase Inverter	12AX7	
V2	Driver	12BH7A	
V3	Output	1614	
V4	Output	1614	
V5	Rectifier	5Y3GT	
V6	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Electro-Voice PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	500	4247	AFH2-72	BO530	FP288	TMD-62	D-275	TVL-2940
B	▲40	500							
C2A	▲40	500	4247	AFH2-72	BO530	FP288	TMD-62	D-275	TVL-2940
B	▲40	500							
C3	20	450	4246	AFH1-50	AO460	FP144	TMS-55	S-260	TVL-1714
C4	50	100	4242	PRS150V5	BR5015	TC49	TD-50-150	FM-1550	TVA-1414

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Electro-Voice PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	.1	200	4265	P288N-1	DF-104	CUB2P1		GEM-401	2TM-P1	
C6	100		4281	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C7	.022	400	4260	BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C8	.022	400	4260	BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C9	.1	600	4241	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C10	10000		4257	BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C11	.022	400	4260	BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C12	.1	600	4241	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C13	.047	400	4243	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C14	.047	400	4243	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C15	.05	1600		P1688N-05		CUB16S5		GEM-1615	16TM-S5	Note 1
C16	.05	1600		P1688N-05		CUB16S5		GEM-1615	16TM-S5	Note 1

Note 1: Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Electro-Voice PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	250K	½	J4686	B-51	A47-250K-Z	Q13-130	U44	Level
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	1Ω	2	K4686					Damping (Wire-wound)
B	1800Ω	2						Damping (Wire-wound)

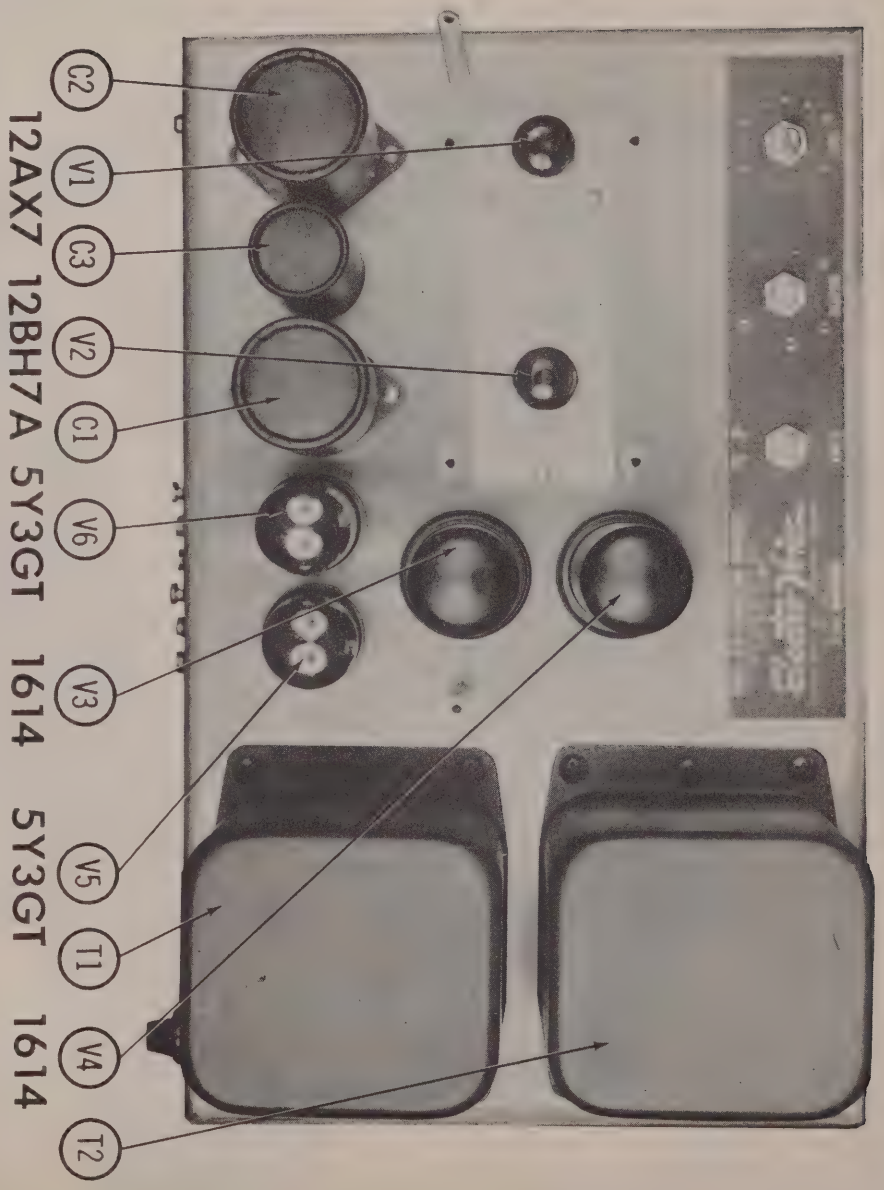
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Electro-Voice PART No.	IRC PART No.	
R3	270K		4669	BTS-270K	
R4	2.7Ω 5%	1	4680		
R5	33K		4665	BTS-33K	
R6	1.2Meg		4656	BTS-1.2Meg	
R7	27K		4651	BTS-27K	
R8	470Ω		4654	BTS-470	
R9	27K		4651	BTS-27K	
R10	56K		4652	BTS-56K	
R11	56K		4652	BTS-56K	
R12	470K		4650	BTS-470K	
R13	12K	2	4679	BTB-12K	
R14	470K		4650	BTS-470K	
R15	12K	2	4679	BTB-12K	
R16	1200Ω		4658	BTS-1200	
R17	470K		4650	BTS-470K	Note 1
R18	470K		4650	BTS-470K	
R19	120Ω		4607	BTS-120	
R20	1000Ω		4693	BTS-1000	
R21	47K		4668	BTS-47K	
R22	470K		4650	BTS-470K	Note 1
R23	470K		4650	BTS-470K	
R24	120Ω		4607	BTS-120	
R25	1000Ω		4693	BTS-1000	
R26	1000Ω		4693	BTS-1000	
R27	100Ω	4	4684	PW4-100	
R28	100Ω	4	4684	PW4-100	

Note 1: Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	Electro-Voice PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ 1A	760VCT @ .050A	760VCT @ .050A	48VAC @ 0A (Bias winding)	1594					
		SEC. 4	SEC. 5	SEC. 6						
		5VAC @ 3A	5VAC @ 3A	6.3VAC @ 2.7A						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Electro-Voice PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	1600Ω CT Tap @ 70V	16Ω Tap @ 8Ω, 4Ω	1593						

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Electro-Voice PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1		5914	1159	CR10	8S20		10	

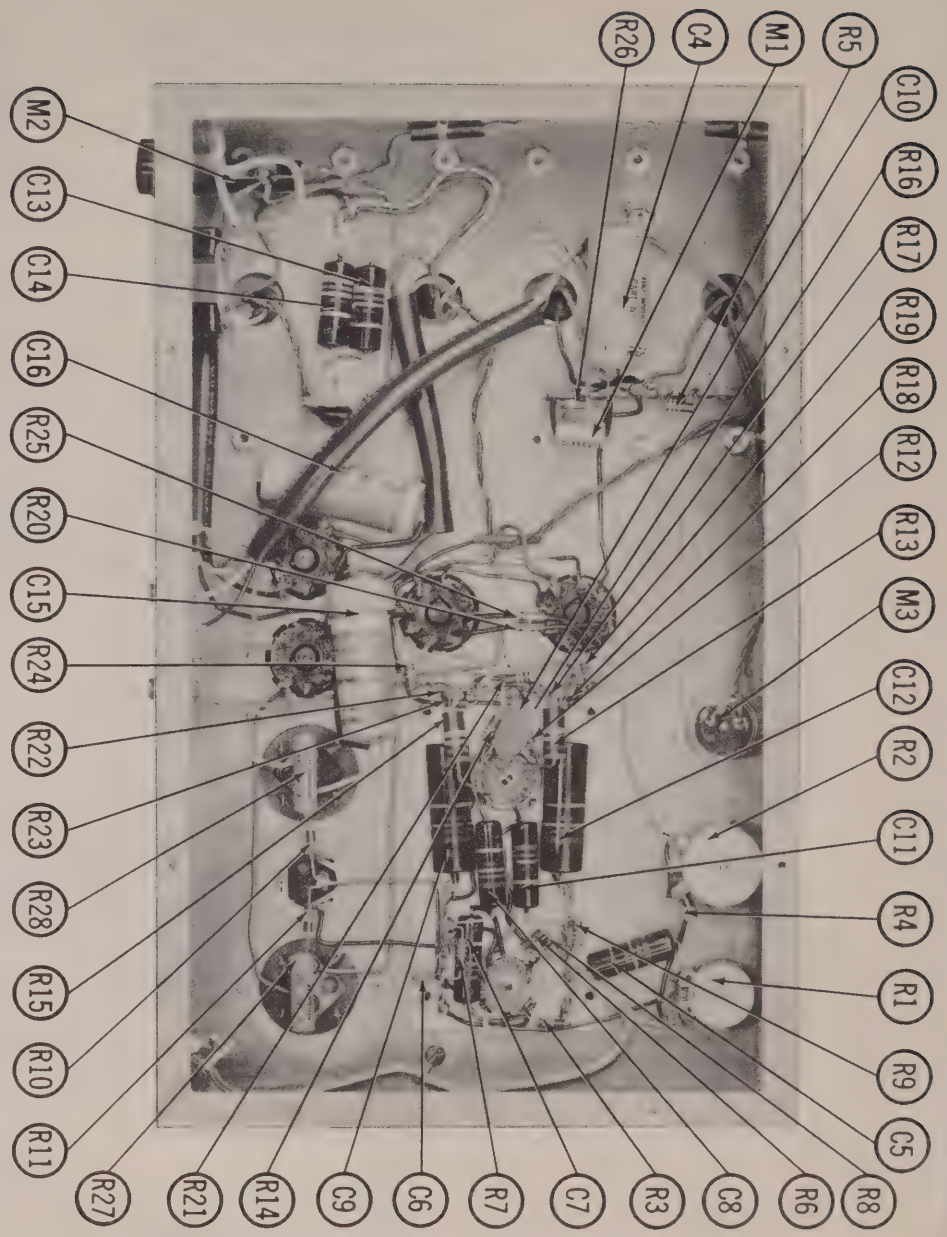
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Electro-Voice PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG S/B	2A 125V	20143		313002. (3AG-S/B-2A)	342001	MDX 2	HKP

MISCELLANEOUS

ITEM No.	PART NAME	Electro-Voice PART No.	NOTES
M3	Switch	B5641	On-Off, Rotary

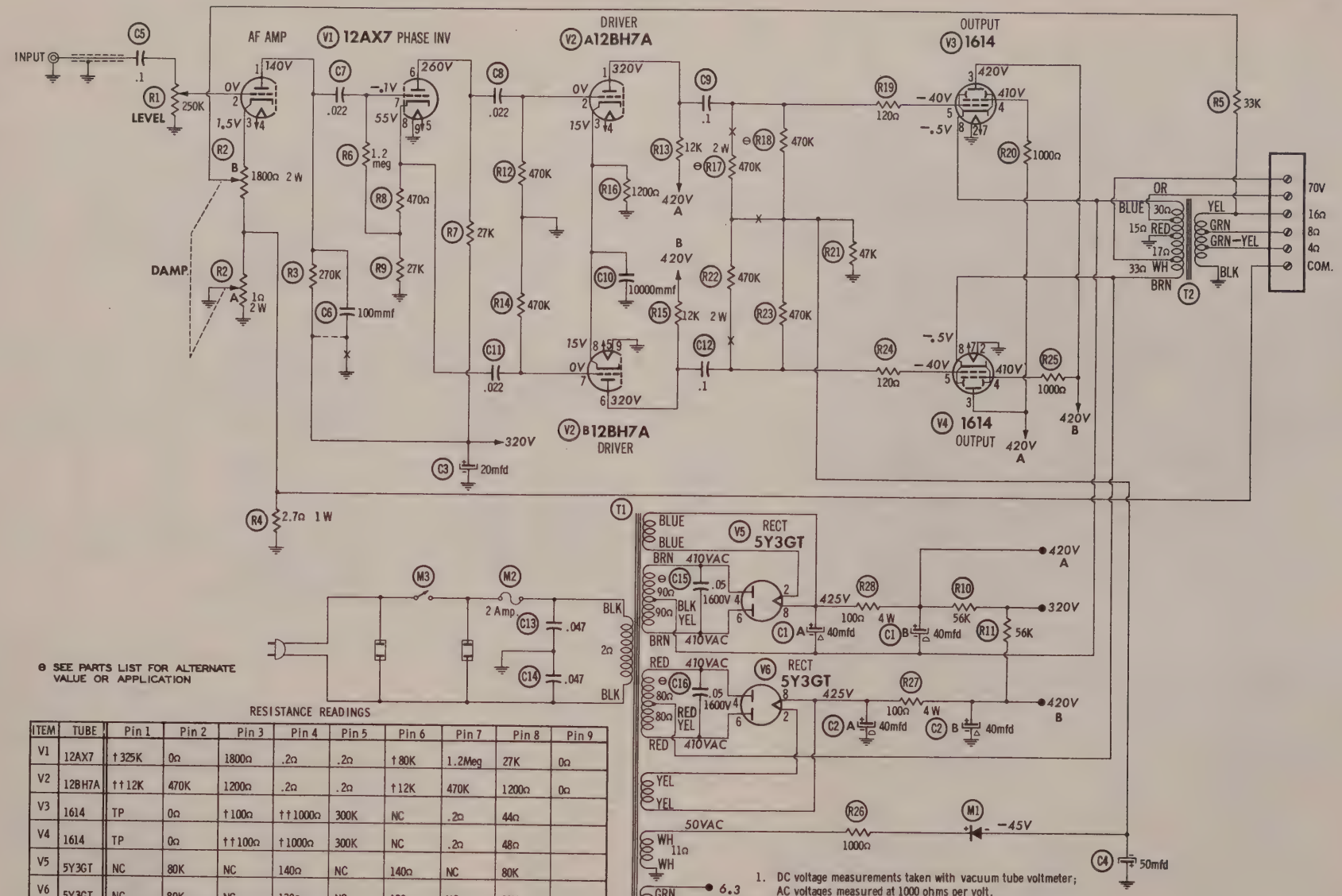
CHASSIS—BOTTOM VIEW



SET 354 FOLDER 5

ELECTRO-VOICE MODEL A30

ELECTRO-VOICE MODEL A30



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†325K	0Ω	1800Ω	.2Ω	.2Ω	†80K	1.2Meg	27K	0Ω
V2	12BH7A	††12K	470K	1200Ω	.2Ω	.2Ω	†12K	470K	1200Ω	0Ω
V3	1614	TP	0Ω	†100Ω	††1000Ω	300K	NC	.2Ω	44Ω	
V4	1614	TP	0Ω	††100Ω	†1000Ω	300K	NC	.2Ω	48Ω	
V5	5Y3GT	NC	80K	NC	140Ω	NC	140Ω	NC	80K	
V6	5Y3GT	NC	80K	NC	130Ω	NC	130Ω	NC	80K	

† MEASURED FROM PIN 8 OF V6.
†† MEASURED FROM PIN 8 OF V5.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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3924 MEADE ST.
DENVER, COLORADO

EMERSON
MODEL 855 (Ch. 120314)

EMERSON
MODEL 855 (Ch. 120314)

TRADE NAME	Emerson Model 855 (Ch. 120314)
MANUFACTURER	Emerson Radio & Phono Corp., 14th & Coles Sts., Jersey City 2, N. J.
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	9 Volts DC
RATING	7 MA @ 9 Volts DC
TUNING RANGE—BROADCAST	540KC - 1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to ant. stator lug on tuning gang. Low side to chassis.	455KC (400% Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Adjust for maximum output.
2.		Loop	1650KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal.	"	A5	"
4.		"	600KC	Tune to 600KC signal.	"	A6	Adjust for maximum output while rocking tuning gang.

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PARTS LIST AND DESCRIPTIONS

EMERSON
MODEL 855 (Ch. 120314)

TRANSISTORS

ITEM No.	USE		EMERSON PART NO.	NOTES
X1	Converter	(2N172)	815009	
X2	1st IF Amp.	(2N145)	815010	Note 1
X3	2nd IF Amp.	(2N147)	815010	Note 1
X4	Driver		815013	
X5	Output	(2N185)	815014	Note 2
X6	Output	(2N185)	815014	Note 2

Note 1: Part #815010 used for types 2N145, 2N146 or 2N147. Replacement from Mfgr. will be type 2N146.
Note 2: X5 and X6 must be a matched pair.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	EMERSON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	20	10	925351	PRS150/25V					
B	80	10		8020/100					
C	100	10							
C2	20	6	925353	SRE6V25	NL20-6	TAP10-20	ML20-6	MMT-625	TE-1091
C3	5	10	925352	SRE25V5	NL5-15	TC30	ML5-15	MMT-0505	TE-1127

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	50000		982139	BPD-05	DF-503					
C5	10000		928758	BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C6	10000		928758	BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C7	20000		928756	BPD-02	DD-203	BYA6S2	ED-02		5HK-S2	
C8	10000		928758	BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C9	20000		928756	BPD-02	DD-203	BYA6S2	ED-02		5HK-S2	
C10	10000		928758	BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C11	10000		928758	BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C12	3300		928757	BPD-0033	D6-332	BYA10D33	GP-3300	UC-5233	5HK-D33	
C13	.04	150	922042		DF-403					

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	EMERSON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	4000Ω	½	390423					Volume & Switch

RESISTORS

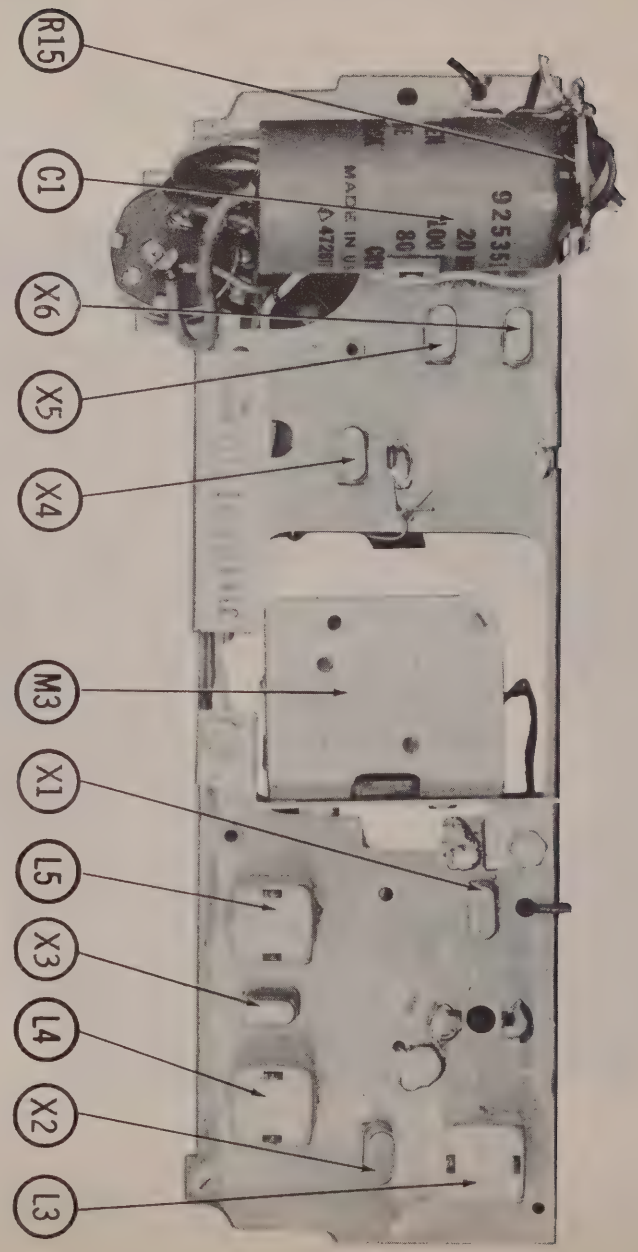
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	EMERSON PART No.	IRC PART No.	
R2	1500Ω		340532	BTS-1500	
R3	150K		341012	BTS-150K	
R4	220Ω		350332	BTS-220	
R5	68K		340932	BTS-68K	
R6	330Ω		340372	BTS-330	
R7	1500Ω		350532	BTS-1500	
R8	2200Ω		340572	BTS-2200	
R9	15K		340772	BTS-15K	
R10	1000Ω		340492	BTS-1000	
R11	220Ω		350332	BTS-220	
R12	3300Ω		340612	BTS-3300	
R13	22K		340812	BTS-22K	
R14	2200Ω		340572	BTS-2200	
R15	220K		351052	BTS-220K	
R16	470Ω		340412	BTS-470	
R17	4700Ω		340652	BTS-4700	
R18	68Ω		340212	BTS-68	
R19	10Ω		340012	BTS-10	
R20	330Ω		340372	BTS-330	
R21	100Ω		350252	BTS-100	

TRANSFORMER (INPUT)

ITEM No.	Turns Ratio		REPLACEMENT DATA						NOTES
	PRI.	SEC.	EMERSON PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2	1	734128				TR-6		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	EMERSON PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	355Ω CT	3-4Ω	734129				TR-27		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	EMERSON PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	180144	4A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		EMERSON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	700114				
L2	Osc. Coil	716105				
L3	1st IF Trans.	720249	16-9002		2041	
L4	2nd IF Trans.	720249	16-9002		2041	
L5	3rd IF Trans.	720248	16-9002		2042	

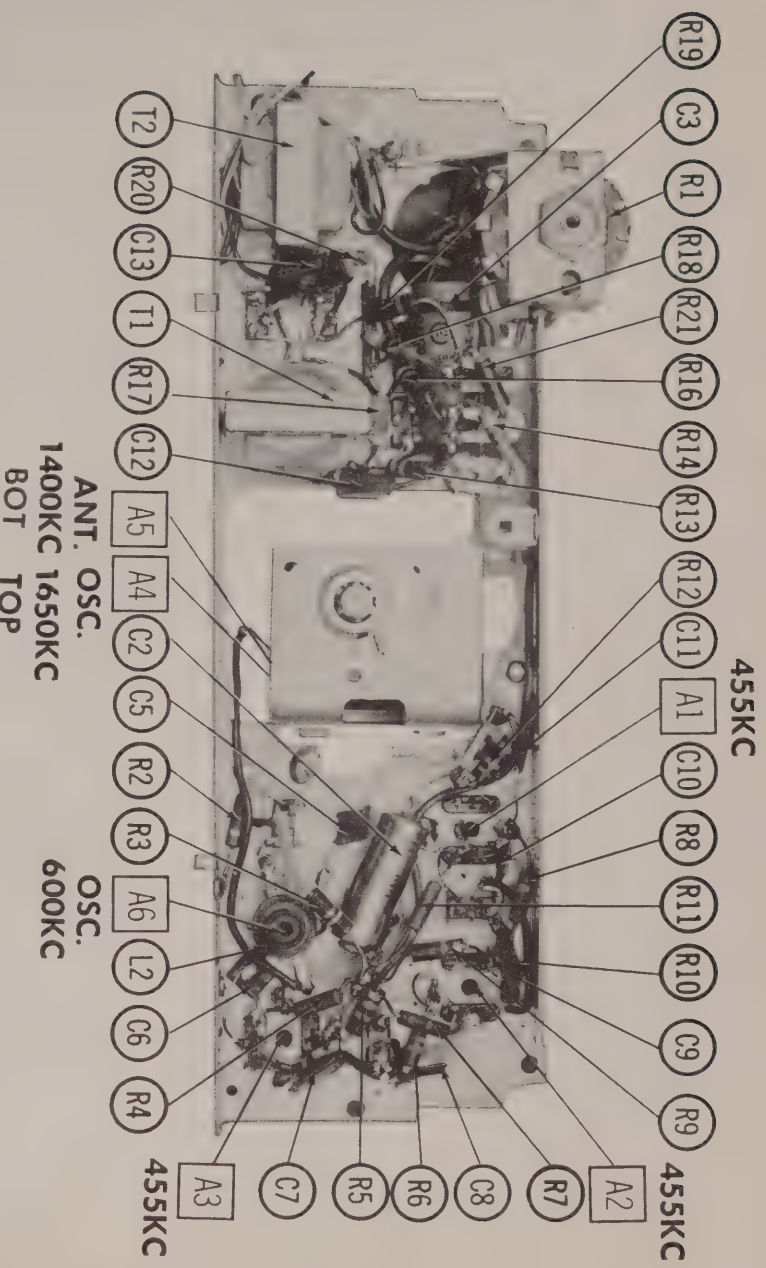
BATTERIES

ITEM No.	VOLTAGE	EMERSON PART No.	REPLACEMENT DATA								
			BURGESS			EVEREADY			MALLORY		
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	"A"	"B"	"A-B"
M1	9V	818116		276			D6			M1603	
M2	9V	818116		276			D6			M1603	

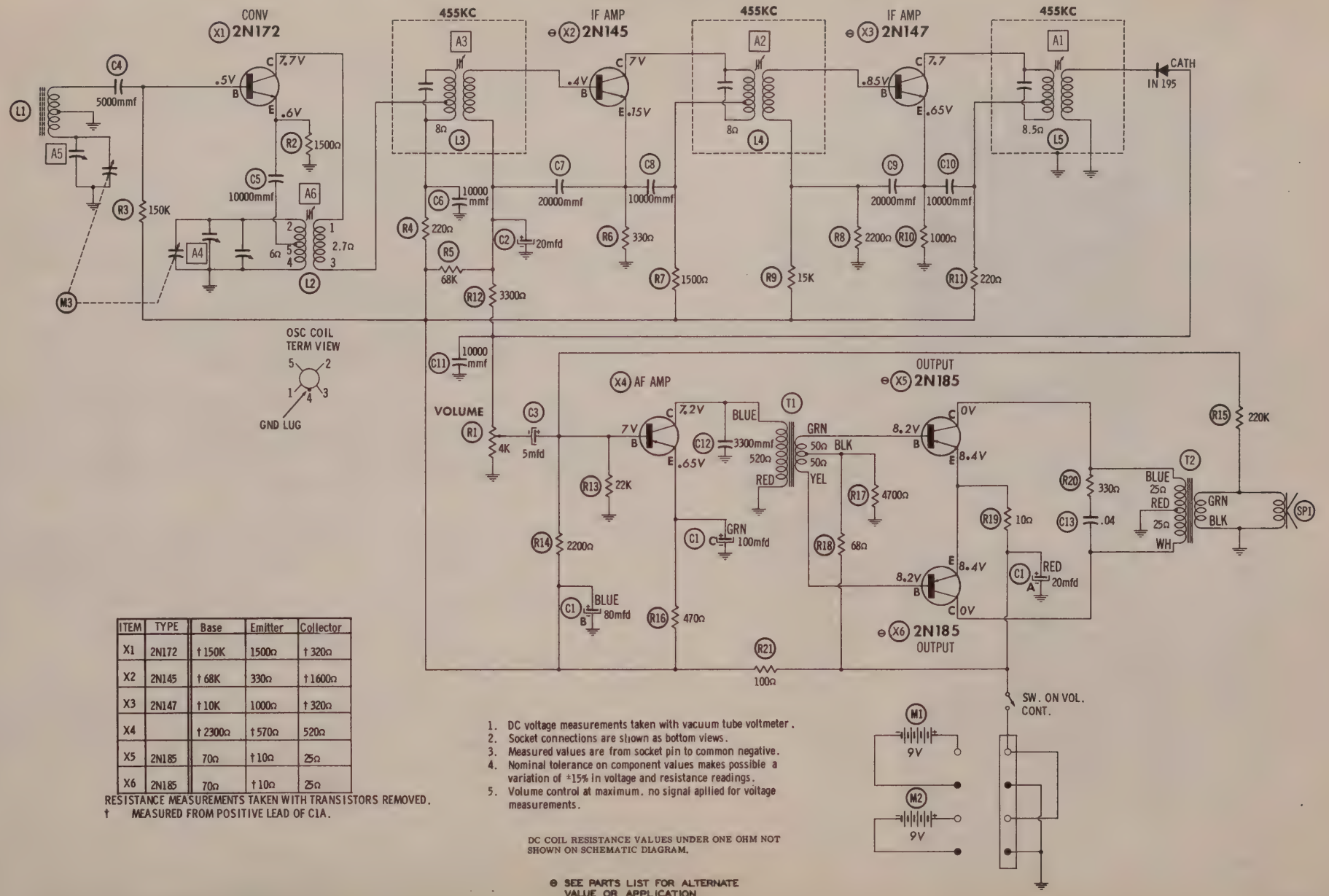
MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M3	Tuning Cap.	900146	Two Gang (21-145MMF, 25-128MMF)
	Knob	460746	Tuning
	Knob	460705B	On-Off-Volume
	Cabinet	140761	Red, Leather
	Cabinet	140761A	Blue, Leather
	Cabinet	140761B	Champagne, Leather
	Cabinet	140761C	Cinnamon, Leather
	Cabinet	140761D	Cordovan, Leather

CHASSIS—BOTTOM VIEW



EMERSON
MODEL 855 (Ch. 12031)



ITEM	TYPE	Base	Emitter	Collector
X1	2N172	†150K	1500Ω	†320Ω
X2	2N145	†68K	330Ω	†1600Ω
X3	2N147	†10K	1000Ω	†320Ω
X4		†2300Ω	†570Ω	520Ω
X5	2N185	70Ω	†10Ω	25Ω
X6	2N185	70Ω	†10Ω	25Ω

RESISTANCE MEASUREMENTS TAKEN WITH TRANSISTORS REMOVED.
† MEASURED FROM POSITIVE LEAD OF C1A.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal apllied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

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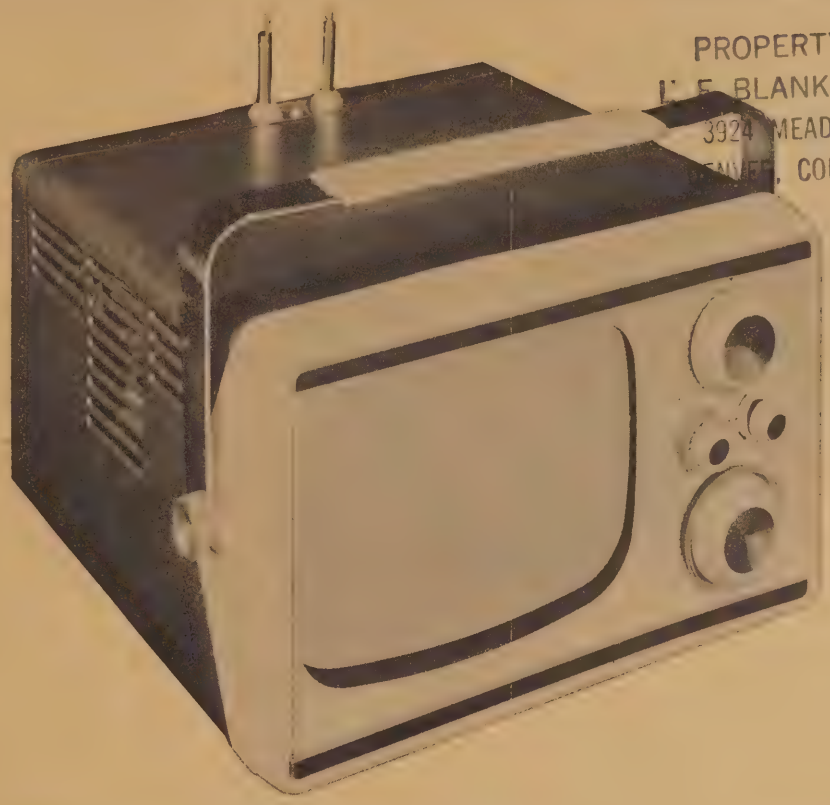

EMERSON MODELS
1232 (Ch. 120331-H), 1233 (Ch. 120332-R)

EMERSON MODEL 1232 (Ch. 120331-H)

TRADE NAME	Emerson	MODELS	CHASSIS
		1232	120331-H
		1233	120332-R
MANUFACTURER	Emerson Radio & Phonograph Corp., 14th & Coles Streets, Jersey City 2, N. J.		
TYPE SET	TV-Radio Combination Receiver		
TUBES	(TV) Fourteen (Radio) Two		
POWER SUPPLY	110-120 Volts AC - 60 Cycles	RATING (TV) 105 Watts, 1 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45. 75MC, Sound IF 41. 25MC (Intercarrier) Radio Tuning AM 540-1650KC, AM IF 455KC		

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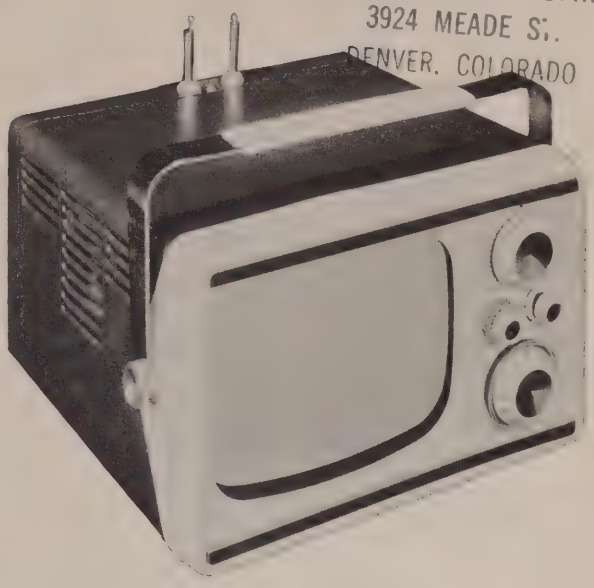
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 push-on type control knobs from the front, 3 from the back.
2. Set receiver on back with picture tube up.
3. Remove 2 metal screws holding the front and remove front.
4. Remove 4 chassis bolts from the bottom.
5. Set receiver down to normal position and slide chassis out the front.



MODEL	CHASSIS
1232	120331-H

EMERSON MODELS
1232 (Ch. 120331-H), 1233 (Ch. 120332-R)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner may be accomplished by removing the channel selector and fine tuning knobs. Channel 13 adjustment is located above and to the right of the shaft. Slugs for channels 6, 4 and 2 are accessible one at a time through hole to left. Adjust in sequence of highest to lowest channel.

PICTURE TUBE SAFETY GLASS CLEANING

1. Place set on back with picture tube up.
2. Remove 6 push-on type control knobs from the front.
3. Remove 2 metal screws from bottom holding front of cabinet and remove the front.

FOCUS

Focus may be varied by means of a focus control on the rear of the chassis.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Turn set on and tune in a TV station, preferably with a test pattern.
Set horizontal hold at mid-position.
Adjust horizontal frequency slug (B1) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the discriminator secondary (A8) located on top of chassis.

FUSES

One fuse is used for LV power supply protection. For location see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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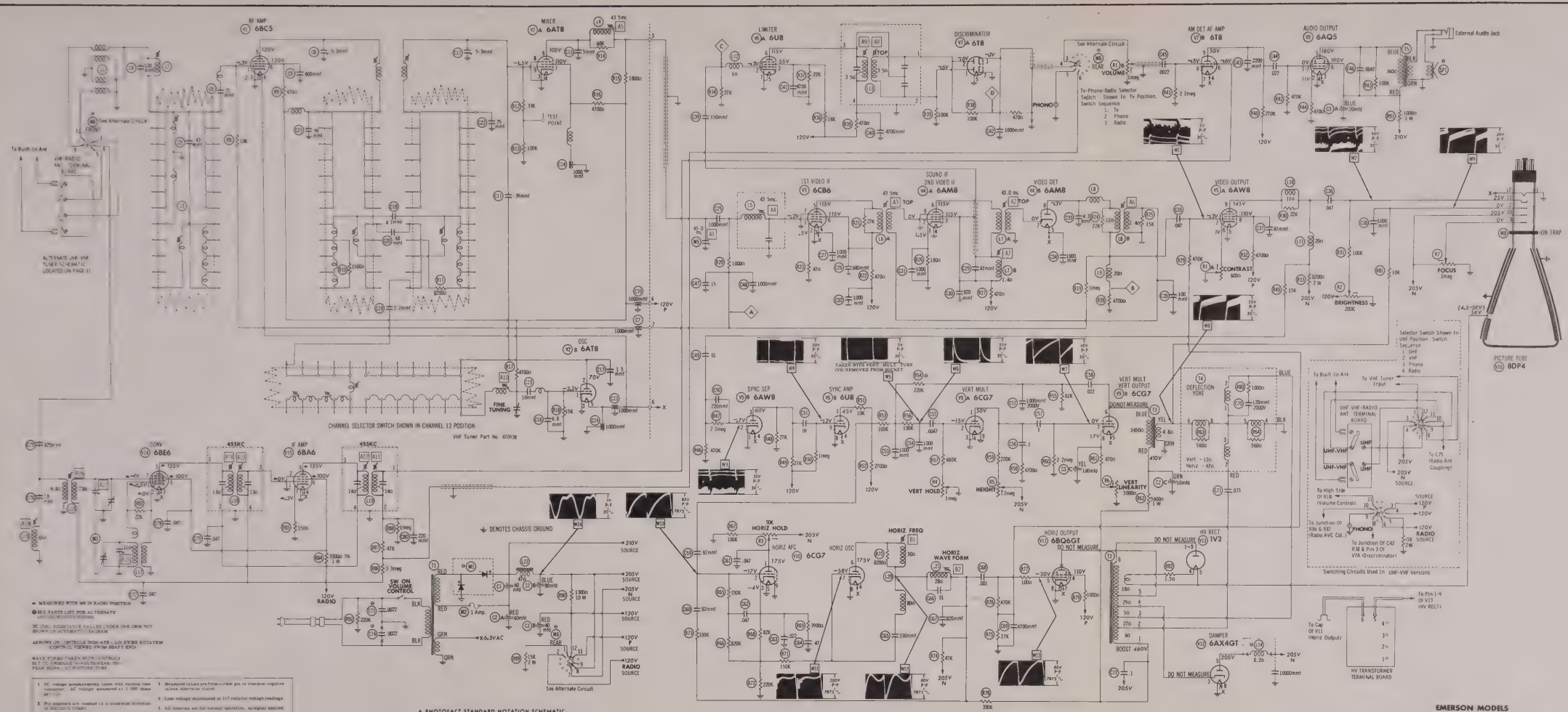
RF AMP V1 6BC5
MIXER V2A 6AT8
OSC V2B 6AT8
LIMITER V5A 6U8
DISCRIMINATOR V7A 6T8
AM DET AF AMP V7B 6T8
AUDIO OUTPUT V6 6AQ5
1ST VIDEO IF V3 6CB6
SOUND IF 2ND VIDEO IF V4A 6AM8
VIDEO DET V4B 6AM8
VIDEO OUTPUT V5A 6AW8
SYNC SEP V5B 6AW8
SYNC AMP V6B 6U8
VERT MULT V9A 6CG7
VERT MULT VERT OUTPUT V9B 6CG7
CONV V14 6BE6
IF AMP V15 6BA6
HORIZ AFC V10 6CG7
HORIZ OUTPUT V11 6BQ6GT
HV RECT V13 1V2
DAMPER V12 6AX4GT
PICTURE TUBE V16 8DP4
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
VHF Tuner Part No 470938
ALTERNATE UHF-VHF TUNER SCHEMATIC LOCATED ON PAGE 11
DENOTES CHASSIS GROUND
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EMERSON MODELS
1232 (Ch. 120331-H), 1233 (Ch. 120332-R)

EMERSON MODELS
1232 (Ch. 120331-H), 1233 (Ch. 120332-R)

TUBE PLACEMENT CHART

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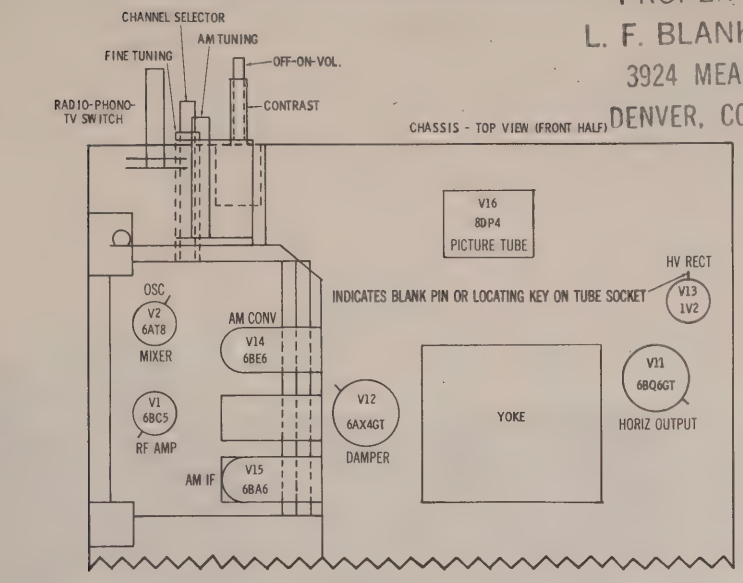
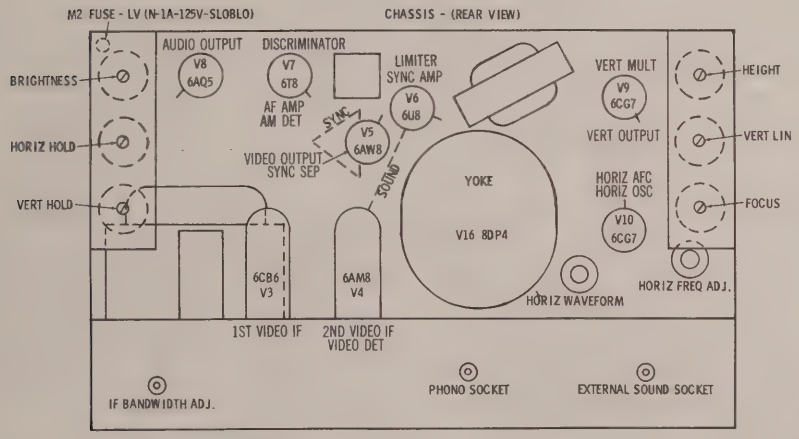


TOP VIEW



TUBE FAILURE CHECK CHART

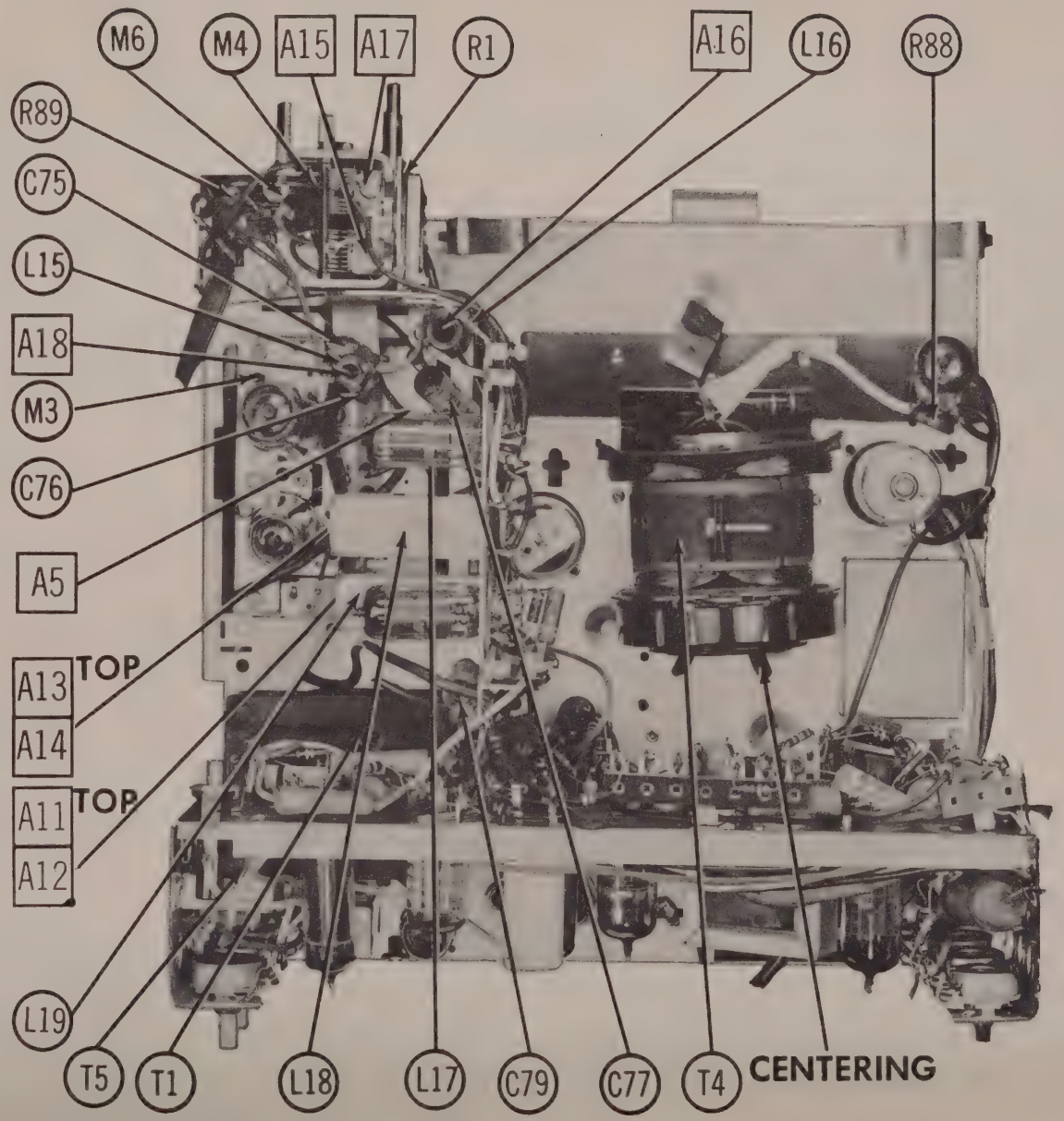
The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Fuse (M2), Rectifier (M1)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4**
No pic, no sound, has snow - **V1, V2**
No pic, has sound, has raster - **V4, V5, V16**
Has pic, no sound - **V6, V7, V8**

SYNC FAILURE
No vert. sync - **V5, V6, V9**
No horiz. sync - **V5, V6, V10**
No vert. or horiz. sync - **V5, V6**

SWEEP FAILURE
No raster, has sound - **V10, V11, V12, V13, V16**
No vertical deflection - **V9**
Poor vert. linearity or foldover - **V9**
Poor horiz. linearity or foldover - **V10, V11, V12**
Narrow picture - **V10, V11, V12, M1**
Vert. off freq. - **V5, V6, V9**
Horiz. off freq. - **V5, V6, V10**



CHASSIS TOP VIEW

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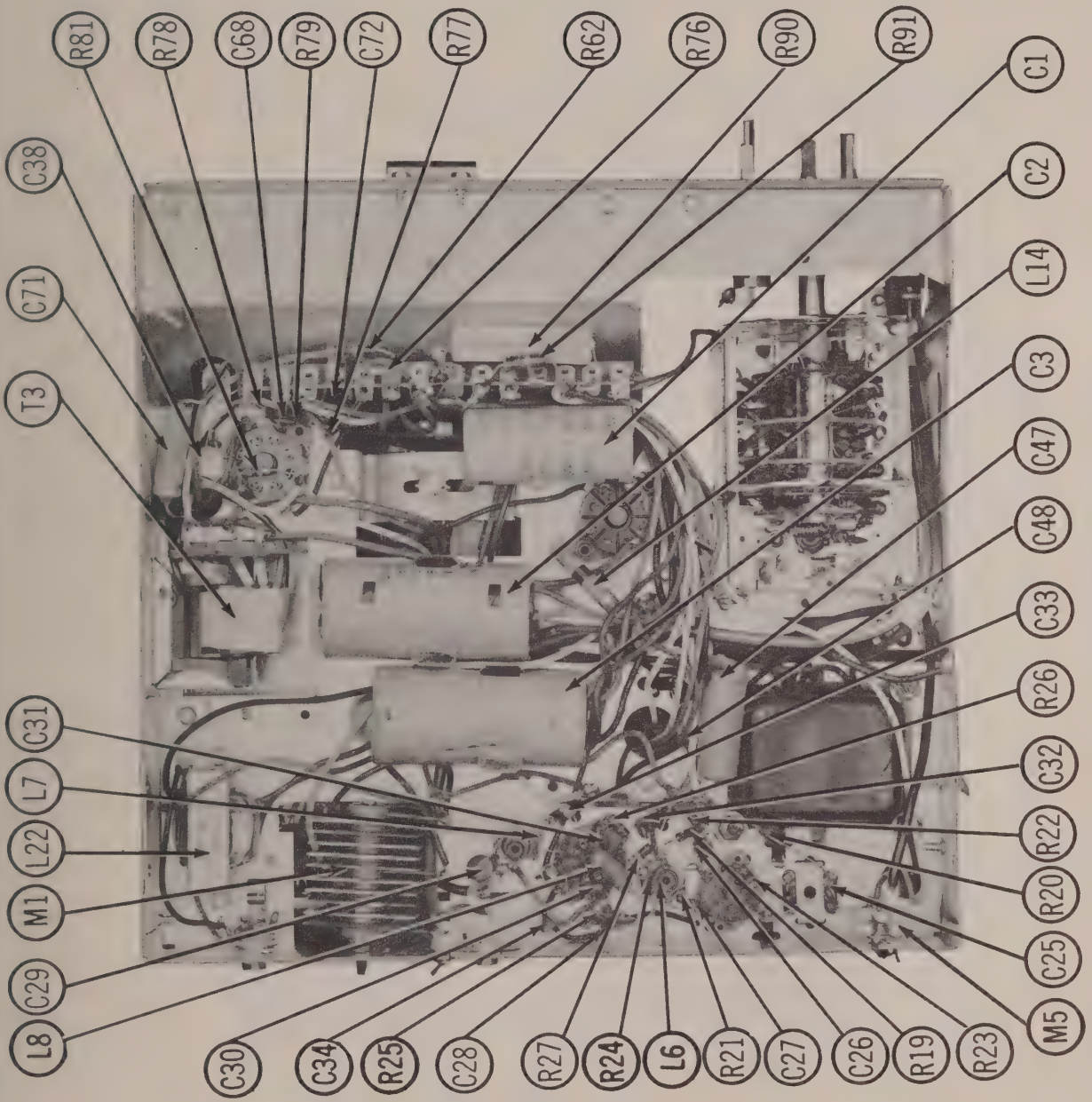
CHASSIS-BOTTOM VIEW



ALIGNMENT INSTRUCTIONS

VIDEO IF ALIGNMENT

Connect negative lead of a 3 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube. Low side to chassis.	Not used.	45MC (unmod)	Any unused channel.	USE VTVM DC probe to point (B). Common to chassis.	A1, A2	Preset A1 fully clockwise. Use only enough generator output to provide usable indication on VTVM. Adjust A2 for maximum deflection on VTVM.
2.	"	"	"	43.5MC	"	"	A3, A4, A5	Use only enough generator output to provide usable indication on VTVM. Adjust A3, A4 and A5 for maximum deflection on VTVM.
3.	"	"	44.0MC (10MC Swp)	45.75MC	"	Vert. amp. thru 10K to point (B). Low side to chassis.		Use only enough sweep generator output to provide usable pattern on scope. Check for response curve similar to Fig. 1. Adjust A1 to place marker at 40% point on curve. A1 also affects bandwidth which should be 3MC.

SOUND IF ALIGNMENT

1. Loosely couple antenna to receiver antenna terminals and tune in a weak TV signal.
2. Connect the DC probe of the VTVM to point (C) and adjust A6 and A7 for maximum negative reading on VTVM. Make sure that signal is weak enough that tuning will be sharp.
3. Connect DC probe to point (D). Detune A8 for maximum negative reading on VTVM.
4. Adjust A9 for maximum negative deflection on VTVM.
5. Readjust A8 toward original position of slug for MINIMUM voltage reading on VTVM. Check Audio, if it is distorted, repeat steps 1 thru 5.

OSCILLATOR ALIGNMENT FOR TUNER #470938

Adjustment of the oscillator may be accomplished by removal of the Channel Selector and fine tuning knobs. Channel 13 adjustment (A10) is located above and to the right of the channel selector shaft. All other channel adjustments (channels 12-2) are reached thru a hole to the left of the channel selector shaft. (See Fig. 2 for adjustment locations.) Tune in the highest channel operating in the vicinity and adjust for best picture and sound. Channel 13 (A10), 6, 4 and 2 are adjusted by turning slugs. All other channels are adjusted by bending coils visable at the access hole starting with highest channel and working down.

OSCILLATOR ALIGNMENT FOR TUNER #470957

Adjustments of the oscillator may be accomplished by removing the Channel Selector and Fine Tuning knobs. The adjustment slugs are accessible, one at a time through a hole in the front of the tuner as the receiver is switched to each Channel. Adjust the oscillator slug of each available channel for best picture and sound.

RADIO ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
4.	.05MFD	High side to AM antenna stator lug on tuning gang. Low side to chassis.	455KC (400% Mod)	Radio	Tuning gang fully open.	Across voice coil.	A11, A12, A13, A14	Adjust for maximum output.
5.		Loop	1638KC	"	"	"	A15	"
6.		"	600KC	"	600KC	"	A16	"
7.		"	1425KC	"	Tune to 1425KC signal.	"	A17	"
8.		"	455KC	"	Tuning gang fully open.	"	A18	Adjust for MINIMUM output.

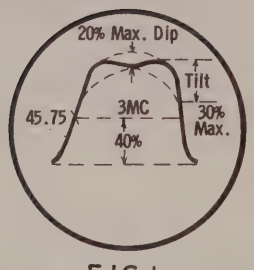


FIG. 1

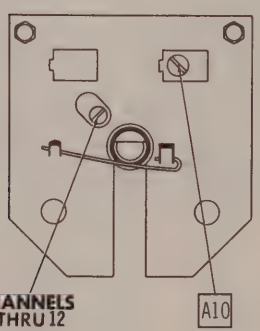
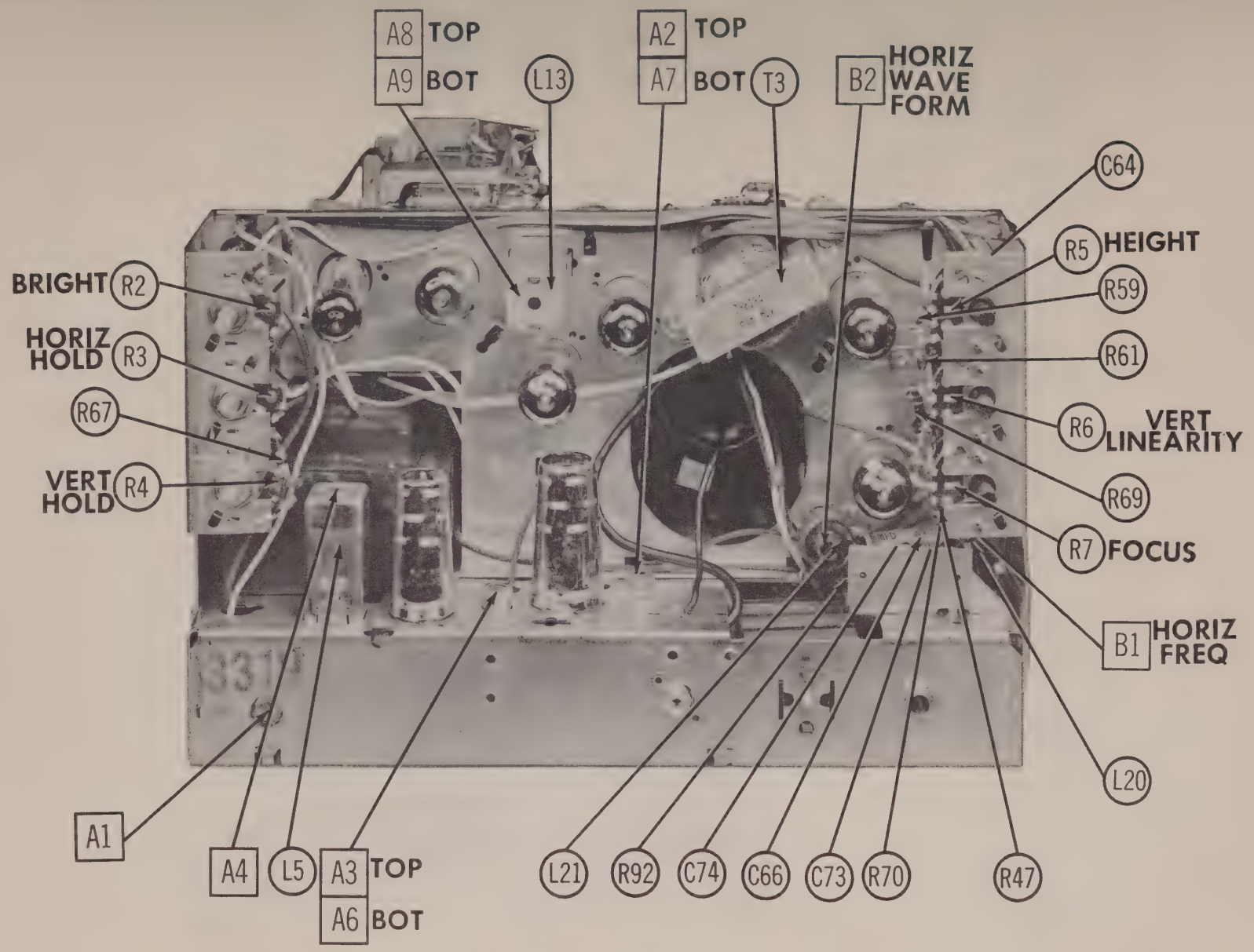
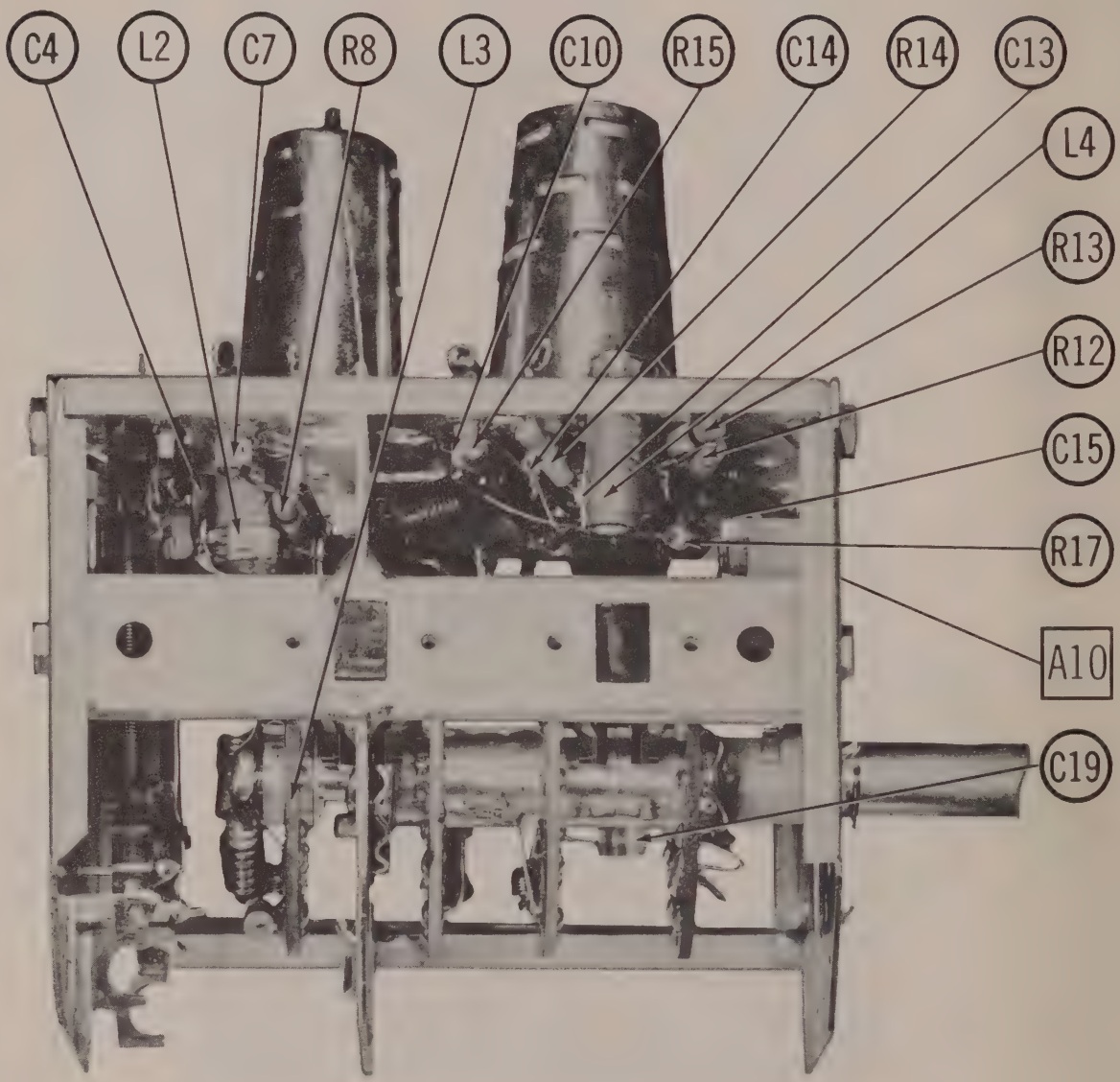


FIG. 2

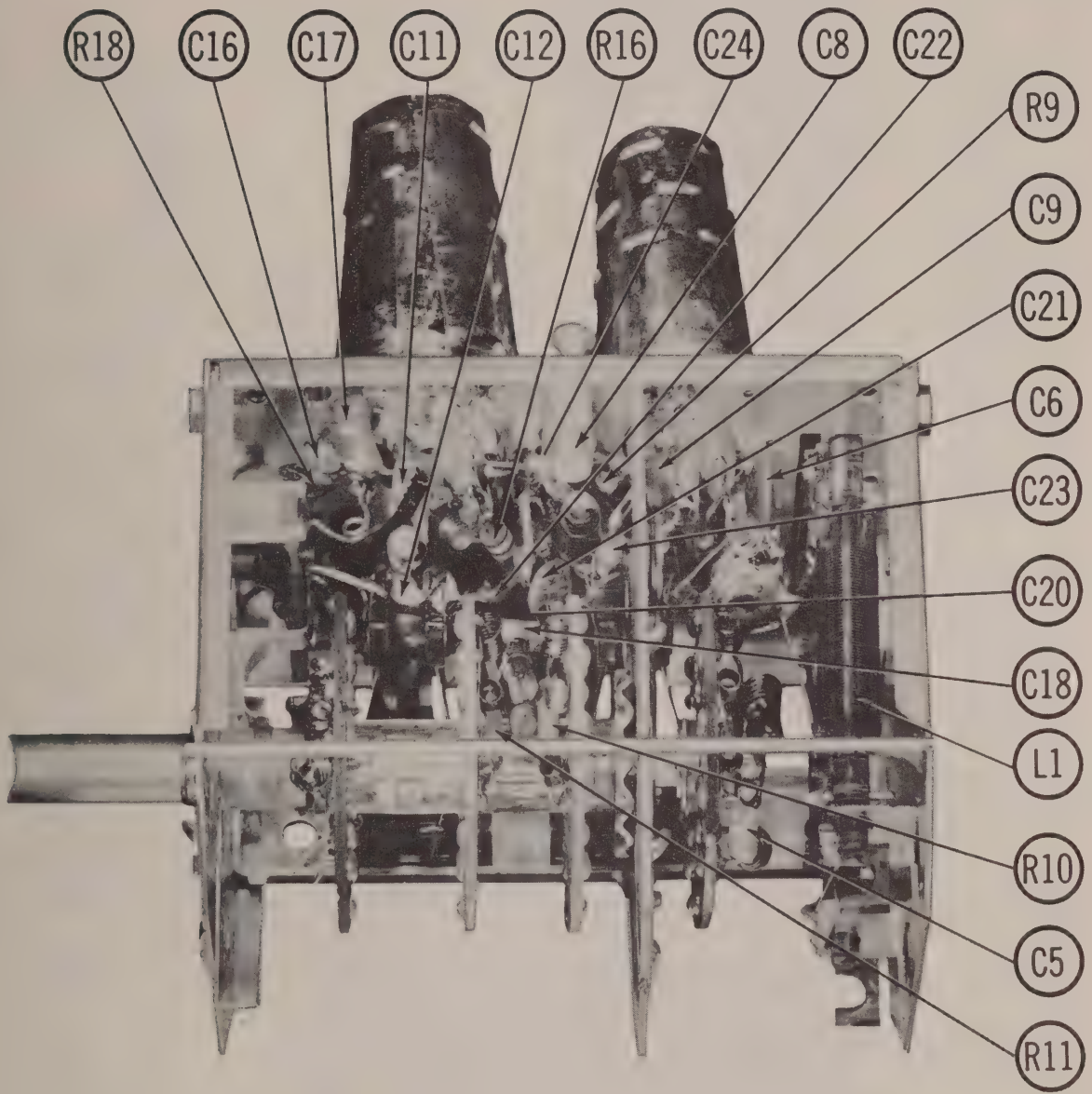


CHASSIS REAR VIEW

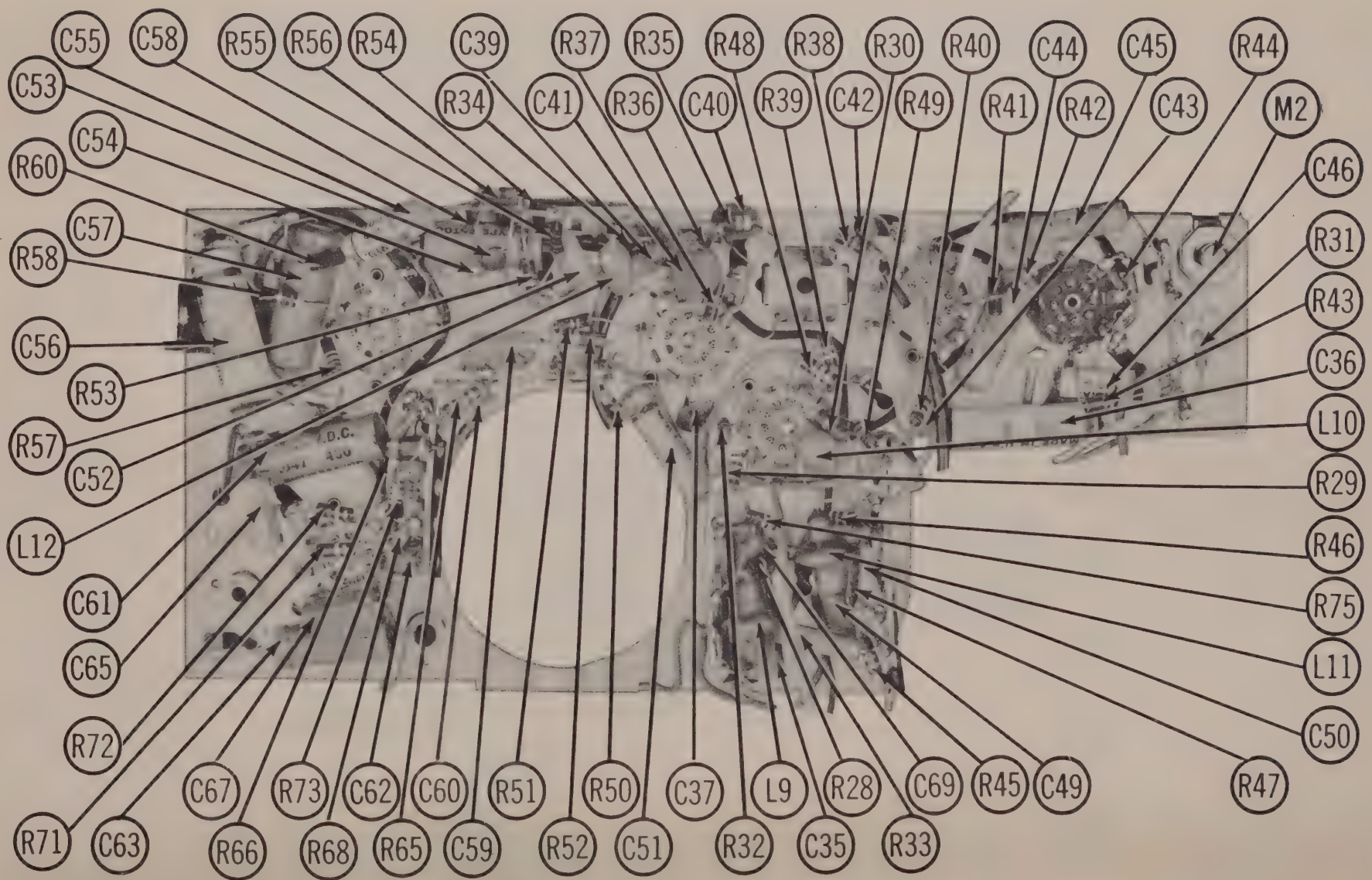
EMERSON MODELS
1232 (Ch. 120331-H), 1233 (Ch. 120332-R)



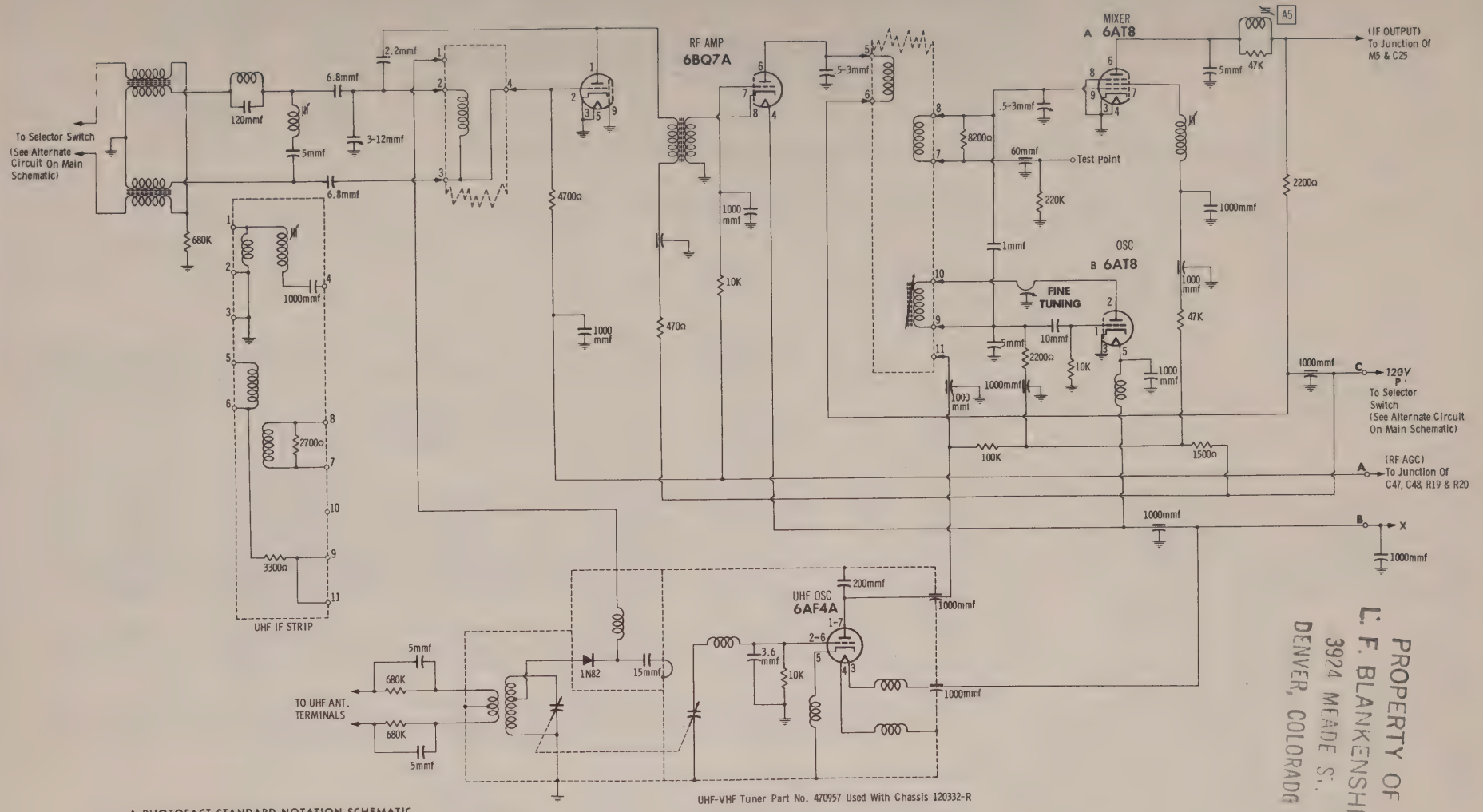
RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE



VERTICAL CHASSIS BOTTOM VIEW



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UHF-VHF Tuner Part No. 470957 Used With Chassis 120332-R

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ALTERNATE UHF-VHF TUNER SCHEMATIC

1232 (Ch. 120331-H), 1233 (Ch. 120332-R)

EMERSON MODELS

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amp.	6BK5	
V2	Mixer/Osc.	6AT8	
V3	1st Video IF Amp.	6CB6	
V4	2nd Video IF Amp.	6CG7	
	Video Det.,	6AH4	
V5	Video Output Amp.	6AW8	
V6	1st Sound IF Amp.	6U8	
V7	Discriminator/AM Det.	6T8	
	AF Amp.	6T8	

ITEM No	USE	TYPE	NOTES
V8	Audio Output	6AQ5	
V9	Vert. Mult.		
	Vert. Output	6CG7	
V10	Horiz. Osc./Horiz. Osc.	6CG7	
V11	Horiz. Amp.	2-6JE6C	
	Damper	6AX4GT	
V12	HV Rectifier	1V2	
	Converter	6BA8	
V13	1st Amp.	6BA8	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA			NOTES
	EMERSON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V16	8DP4	8DP4		

ELECTROLYTIC CAPACITORS

ITEM No	RATING			REPLACEMENT DATA						
	CAP.	VOLT		EMERSON PART No.	ARROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	60	150		422346	PRS60V60	MR60U5	TC62	TD-80-350	MT-6550	TVA-1415
C3A	60	150		422371	PRS60V60		DP3U1.5		MT-6550	R3358*
B	80	250							MT-4350	
C	40	150								
C5A	20	150		425370	PR320-25		WQ349	TDLD-21 TD-100-50	HO-230 MT-08100	R3356*
B	45	150								
C	100	50								

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	VOLT	REPLACEMENT DATA EMERSON PART No.	ARROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	100		25-100031-100							M1500
C5	43		425-4347-29							
C6	21		32-xx2370-050	MPG-61 26	TC3-27	C1G3P3C	TCG-31			
C7	1000		23-9443	EY-201	MPT-1000				503C-D1	
C8	8-3		32B-4172-13		BP3-8		513-D	CT5S5A		
C9	800			BPD-0006	DD-801	LM7S	ED-800	UC-588	5GA-T8	
C10	1000		23-9681-T	EY-201	MPT-1000				503C-G1	
C11	150		32B-4947-30							
C12	8-3		32B-4172-13		B3B-3		513-D	CT5S5A		
C13	9		32-1300500-100	MPG-61 5	TC3-5	C1G5C	TCG-5	ET-5S5	5TCCB-V5	
C14	1000		23-300173-1	EY-201	MPT-1000				503C-D1	
C15	1000		32-1300500-050	MPG-61 10	TC3-10	C1G10C	TCG-10	ET-541	5TCCB-V10	
C16	6.8		32-1300680-100	MPG-81 6.8	TC2-6R8	C1F6R8C	TCC-6.8	ET-5S68	5TCCB-V68	
C17	5.5		32B-4948-18							M1500
C18	6.7		32B-4947-12	MPG-61 6.7	TC3-6R7	C1G7.7C	TCG-6.7	ET-5547	5TCCB-V47	
C19	5.6		32B-4947-13	MPG-81 5.6	TC2-5R6	C1F5R6C	TCC-5.6		5TCCB-V56	
C20	68		32P-4947-1		TC2-R68					
C21	39		32-xx390-xxx							
C22	15		32-xx150-xxx	NT50-61 15	TC1H-15	C1H15C	TCT-15	MT-6415	5TCU-Q75	
C23	1000		23-300173-1	EY-201	MPT-1000				503C-D1	
C24	1000		23-300173-1	EY-201	MPT-1000				503C-D1	
C25	1000		939023	BPD-001	DD-102	SYA5D1	ED-1000	DC521	51EK-D1	
C26	680		939019	BPD-0006S	DD-681	SYA5GT6S	ED-680	UC-5588	5GA-T68	
C27	1000		939023	BPD-001	DD-102	SYA5D1	ED-1000	DC521	51EK-D1	
C28	100		939007	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C29	680		939019	BPD-0006	DD-681	LM9Q1	ED-47	UC-5547	5GA-Q47	
C30	820		939010	BPD-0008J	DD-821	SYA5T6S	ED-820	UC-5585	5GA-T82	
C31	1000		939023	BPD-001	DD-102	SYA5D1	ED-1000	DC521	51EK-D1	
C32	1000		939023	BPD-001	DD-102	SYA5D1	ED-1000	DC521	51EK-D1	
C33	4.7		939032	BPD-51 4.7	TC2-4.7	C1F4.7C	TCC-4.7	ET-5547	5TCCB-V47	
C34	1000		939023	BPD-001	DD-102	SYA5D1	ED-1000	DC521	51EK-D1	
C35	.047	600	932554	BPD-05	DF-503	CU3S4S7		GEM-4147	47M-S47	
C36	.047	600	932554	BPD-05	DF-503	CU3S4S7		GEM-4147	47M-S47	
C37	47		939095	BPD-0000 47	DD-470	L09Q47	ED-47	UC-5547	5GA-Q47	
C38	1000		939023	BPD-001	DD-102	SYA5D1	ED-1000	DC521	51EK-D1	
C39	180		939003	BPD-0005	DD-181	L10T15	ED-150	UC-5315	5GA-T15	
C40	4700		939033	BPD-0047	DD-472	SYA5D47	GP-4700	UC-5847	51EK-D47	
C41	4700		939033	BPD-0047	DD-472	SYA5D47	GP-4700	UC-5847	51EK-D47	
C42	1000		939023	BPD-001	DD-102	SYA5D1	ED-1000	DC521	51EK-D1	
C43	1500		939031	BPD-0015	DD-152	SYA5D15	GP-1500	UC-5215	51EK-D15	
C44	.033	400	932524	BPD-02	DF-303	CU3S4S23		GEM-4123	47M-S23	
C45	.0033	600	932523	BPD-002	DF-302	CU3S4D23	GP-2200	GEM-4223	47M-D23	
C46	.0047	600	934753	BPD-0047	DD-472	CU3S4D47	GP-4700	GEM-6247	47M-D47	
C47	.15	200	933231	PS8M-15		CU3EP15		GEM-3015	47M-P15	
C48	1000		939023	BPD-001	DD-102	SYA5D1	ED-1000	DC521	51EK-D1	
C49	.01	600	932514	BPD-01	DD-103	CU3S4S1	GP-10000	GEM-412	47M-S1	
C50	.033	400	931184	BPD-002	DF-303	CU3S4S23	GP-2200	GEM-4123	47M-S23	
C51	.01	600	932514	BPD-01	DD-103	CU3S4S1	GP-10000	GEM-412	47M-S1	
C52	1000	3000	939024	BYD-30-1000	DD0-102	SYB3D2N	GP-1000	DC521	30GA-01	
C53	1000		939019	BPD-001	DD-102	SYA5D1	ED-1000	DC521	51EK-D1	
C54	1000		939019	BPD-001	DD-102	SYA5D1	ED-1000	DC521	51EK-D1	
C55	.0047	600	934643	BPD-0047	DD-472	CU3S4D47	GP-4700	GEM-6247	47M-D47	
C56	.1	600	934525	P4S8M-1	DF-304	CU3S4P1		GEM-421	47M-P1	
C57	.1	600	934525	P4S8M-1	DF-304	CU3S4P1		GEM-421	47M-P1	
C58	.033	400	932523	BPD-023	DF-303	CU3S4S23		GEM-4123	47M-S23	
C59	82		92180	1468-000082	DS-820	SYSG83	CT10C820K		MS-432	
C60	82		92180	1468-000082	DS-820	SYSG82	CT10C820K		MS-432	
C61	.047	600	932554	BPD-05	DF-503	CU3S4S47		GEM-4147	47M-S47	
C62	.047	600	932554	BPD-05	DF-503	CU3S4S47		GEM-4147	47M-S47	
C63	.033	400	932524	BPD-23	DF-303	CU3S4S23		GEM-4123	47M-S23	
C64	.47		933385	PS8M-47		CU3EP47		GEM-3247	47M-P47	
C65	.01	600	93187	1467-00053	DD-391	SYST33	CT15C331J	UC-5333	M8-333	
C66	.01	600	934564	BPD-01	DD-103	CU3S4S1	GP-10000	GEM-412	47M-S1	
C67	.033	400	932523	1467-00063	DD-331	SYST33	CT15C331J	UC-5333	M8-332	
C68	.033	600	932523	BPD-001	DD-103	CU3S4D1	GP-1000	GEM-412	47M-D1	
C69	4700		939033	BPD-0047	DD-472	SYA5D47	GP-4700	UC-5347	51EK-D47	
C70	130	3000	939048			SYB3D7L2			30GA-T12	
C71	.033	400	932524	BPD-03	DF-305	CU3S4S23		GEM-2323	47M-S23	
C72	.1	600	934525	P4S8M-1	DF-304	CU3S4P1		GEM-421	47M-P1	
C73	.0033	600		BPD-0033	DD-332	CU3S4D23	GP-3300	GEM-4323	47M-D23	Note 1
C74	.0033	600		BPD-0033	DD-332	CU3S4D23	GP-3300	GEM-4323	47M-D23	Note 3
C75	470		939007	BPD-0047	DD-471	SYA5D47	ED-470	UC-5347	5GA-T47	
C76	18									
C77	.047	600	932554	BPD-05	DF-503	CU3S4S47		GEM-4147	47M-S47	
C78	.047	600	932554	BPD-05	DF-503	CU3S4S47		GEM-4147	47M-S47	

CAPACITORS (cont)

ITEM No	RATING CAP	VOLT	EMERSON PART No	REPLACEMENT DATA AEROVOX PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No	NOTES
C79	.047	400	932554	BPD-05	DF-503	CU3S4S47		GEM-4147	47M-S47	
C80	220		933385	PS8M-47		CU3EP47		GEM-3247	47M-P47	

Note 1. Some versions use .01MFD @ 600V in this application. (Part #932350)
Note 2: Not used in some versions.

CONTROLS

ITEM No	RATING RESISTANCE	WATTS	REPLACEMENT DATA EMERSON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500Ω	½	390806	F1-8	RTY-501		UE-508	Contrast
B	1Meg	½		H2-52	Not Req.		Not Req.	Volume
C	Switch			KB-1	Not Req.		Not Req.	
R2A	250K	½	390808	B-48	A47-250K-B	QU-150	U48	Brightness
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	50K	½	390804	B-31	A47-50K-B	QU-123	U38	Horiz. Hold
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	1Meg	½	390803	B-89	A47-1Meg-B	QU-127	U54	Vertical Hold
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	2Meg	½	390801	BX-75	A47-2Meg-B	BU-139	TA2EL	Height
B	Shaft			Not Req.	KSS-3	TM2-KTT	Not Req.	
R6A	5000Ω	½	390502	BX-10	A47-5000-B	BU-54	TA53L	Vertical Linearity
B	Shaft			Not Req.	KSS-3	TM2-KTT	Not Req.	
R7A	2Meg	½	390501	BX-75	A47-2Meg-B	BU-139	TA2EL	Focus
B	Shaft			Not Req.	KSS-3	TM2-KTT	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING OHMS	WATT	REPLACEMENT DATA EMERSON PART No	IRC PART No	NOTES
R8	10K		34-752	BTS-10K	
R9	470Ω		33-14735	BTS 470	
R10	15.0Ω			BTS-1500	
R11	820Ω		33-26233	BTS-820	
R12	33K		33-33333	BTS-33K	Note 1
R13	100K		33-34033	BTS-100K	
R14	68K		33-36833	BTS 68K	
R15	1800Ω		33-21833	BTS-1800	
R16	4700Ω		33-24733	BTS-4700	
R17	4700Ω		33-24733	BTS-4700	
R18	15K		33-31533	BTS-15K	
R19	1Meg		35212		
R20	100KΩ		350421		
R21	27K		340831		
R22	470Ω		340418	BTS-470	
R23	10Ω		340078	BTS-47	
R24	33K		340812		
R25	15K		340773	BTS-15K	
R26	1800		340312	BTS-180	
R27	4700		340413	BTS-470	
R28	4700Ω		340852		
R29	470K		340132		
R30	82K		350621		
R31	100K		340973	BTS-100K	
R32	4700Ω		340852	BTS-4700	
R33	8200Ω	S	780792	BTS-8200	
R34	27K		340831	BTS-27K	
R35	470Ω		340418	BTS-470	
R36	18K		340793	BTS-18K	
R37	33K		340833	BTS-33K	
R38	100K		340973	BTS-100K	
R39	100K		340973	BTS-100K	
R40	270K		340773	BTS-270K	
R41	2.2Meg		352393	BTS-2.2Meg	
R42	470K		33133	BTS-470K	
R43	100K		340973	BTS-100K	
R44	470Ω		340418	BTS-470	
R45	15K		340773	BTS-15K	
R46	470K		33133	BTS-470K	
R47	2.2Meg		352393	BTS-2.2Meg	
R48	27K		340833	BTS-27K	
R49	27K		340833	BTS-27K	

ITEM No	RATING OHMS	WATT	REPLACEMENT DATA EMERSON PART No	IRC PART No	NOTES
R50	1Meg		35212	BTS-1Meg	
R51	10K		340722	BTS-10K	
R52	2700Ω		340592	BTS-2700	
R53	100K		340972	BTS-100K	
R54	220K		341052	BTS-220K	
R55	68K		340952	BTS-68K	
R56	100K		340972	BTS-100K	
R57	680K		34172	BTS-680K	
R58	4700Ω		340652	BTS-4700	
R59	220K		341052	BTS-220K	
R60	3.3Meg		352328	BTS-3.3Meg	
R61	470Ω		350413	BTS-470	
R62	1000Ω	1	370752	BTA-5000	
R63	560Ω		340432		
R64	560Ω		340433		
R65	330K		340928	BTS-330K	
R66	150K		341152		
R67	100K		340973	BTS-100K	
R68	82K		340952	BTS-82K	
R69	3900Ω		340833		
R70	5200Ω		340752		
R71	150K		34012		
R72	220K		341052		
R73	330K		341092		
R74	47K		340932		
R75	27K		340833		
R76	470K		350138	BTS-470K	
R77	100Ω		350253	BTS-100	
R78	330K		340928	BTS-330K	
R79	100Ω		340423	BTS-100	
R80	1000Ω		340432	BTS-1000	
R81	10K		340732	BTS-10K	
R82	1.5Ω		394143	BWH-1.5	
R83	3.3Meg		352393	BTS-33K	
R84	3300Ω 5%	1	380823	BTA-3300	
R85	150Ω		340392	BTS-150	
R86	3.3Meg		352393	BTS-3.3Meg	
R87	47K		350932	BTS-47K	
R88	1Meg		352323	BTS-1Meg	
R89	15K	3	780773	BTS-15K	
R90	1300Ω	10	394177		
R91	1000Ω	1	370492	BTA-1000	
R92	330K		340957	BTS-330K	

Note 1: A 100K resistor is used in some versions. (Part #340972)

TRANSFORMER (POWER)

ITEM No	RATING PRI.	SEC. 1	SEC. 2	SEC. 3	EMERSON PART No.	REPLACEMENT DATA Halldorson Part No.	Merit Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No
T1	117VAC	90VAC	6.3V		730069					
	@ 1A	@ .5A	@ 7.45A							

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	EMERSON PART No	Halldorson Part No	Merit Part No	RCA TYPE No	Rem Part No	Stancor Part No	Thordarson Part No	Triad Part No
T3	Horiz. Output Trans.	738133							
T4	Vert. Output Trans.	738134							
T4A	Yoke(90°)Horiz(24.5MH	708288					DY-25A 2		
B	Vert(1MH)	708290 1							

1 Yoke rear cover and centering device.
2 Use original yoke rear cover and centering device.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI	SEC	REPLACEMENT DATA EMERSON PART No	Halldorson Part No	Merit Part No	Stancor Part No	Thordarson Part No	Triad Part No	NOTES
T5	5400Ω	3-4Ω	734139	21000 1 2	A-3026	A-3077 1	24351 1	S-6X	1 Drill one new mtg. hole. 2 Tap center tap on primary.

SPEAKER

ITEM No.	TYPE SIZE	FIELD	REPLACEMENT DATA V. C. IMP.	EMERSON PART No	QUAM PART No	NOTES
SP1	4"	PM	3-4Ω	180151 1	4A07	1 Alternate part #180111.

COILS (RF-IF)

ITEM No	USE	EMERSON PART No.	NOTES
L1	Ant. Coils	12A300566-1	
L3	IF Trap	83A300146-1	

ITEM No	USE	EMERSON PART No	NOTES
L3	Ant. Coils	88A300567-1	Includes switch assy.
L4	Mixer Plate Coil	83A300361	

ITEM No	USE	REPLACEMENT DATA EMERSON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L5	1st Video IF	732015				
L5A	2nd Video IF	732033				
B	1st Sound IF					
L7A	3rd Video IF	732052				
B	2nd Sound IF					
L8	Sarbey Peaking Coil	704309	10-1003		4806	4.6 Microhenries
L9	Shunt Peaking Coil	704315	10-3460		6348	880 Microhenries
L10	Series Peaking Coil	704099	10-2300		6133	330 Microhenries
L11	Shunt Peaking Coil	704315	10-3460		6348	880 Microhenries
L12	RF Choke	708208	10-1003		4806	4.6 Microhenries
L13	Discriminator	704310		TV-114	6304	
L14	RF Choke		10-1003		4613	10 Microhenries; SRC part #C11 (Note 1)
L15	455KC Trap	708391				5.1 Millihenries
L16	Antenna Coil	710033				333 Microhenries
L17	AM Osc. Coil	710039				300 Microhenries
L18	1st AM IF	720075	18-6788	BC-353	13-C1	
L19	2nd AM IF	720075	18-6788	BC-353	13-C2	

Note 1: Not used in some versions.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES PRI	SEC	REPLACEMENT DATA EMERSON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No	Rem PART No.	Thordarson PART No.	NOTES
L20	110Ω		716083							Tapped @ 80Ω. Horiz. Osc. Waveform
L21	28Ω		708180						E8-8	

FILTER CHOKE

ITEM No.	RATINGS DC CURRENT	D. C. RESISTANCE	INDUCTANCE @ CURRENT 1000 ~(c)	REPLACEMENT DATA EMERSON PART No.	Halldorson Part No.	Merit Part No	Stancor Part No.	Thordarson Part No.	Triad Part No
L23	.133A	47Ω	.65H	737031					3BC-1 1

1 Drill one new mtg. hole.

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	EMERSON PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.
M1	.140A	837049 1 2	1028A 2 3	1N1613 4	RS250 2 3	85250 2 3	1083035 3	250 2 3

1 Alternate part #837052.
2 Connect 3 on same mounting bolt.
3 Selenium type.
4 Germanium type.

FUSES

ITEM No.	TYPE	RATING	EMERSON PART No. FUSE	HOLDER	LITTELFUSE PART No. FUSE	HOLDER	BUSS PART No. FUSE	HOLDER
M2	N	1A 125V	800014		339001 (N-1A)	340011	N 1	HN 3/4 to 1 1/4

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M3	Tuner	8999999	VHF, Used in Chassis 120331-H.
	Tuner	470157	UHF-VHF, Used in Chassis 120332-R.
M4	Tuning Cap.	900158	Two Gang (13-263MMF, 13-117MMF)
M5	Trimmer Cap.	900127	IF Bandwidth
M6	Switch	510115	TV, Phono, Radio Selector (3 Position, Rotary, Wafer Type) Used in Chassis 120331-H.
	Switch	510118	TV, Phono, Radio Selector (4 Position, Rotary, Wafer Type) Used in Chassis 120332-R.
M7	Centering Device	708290	
M8	Ion Trap	708289	
	Safety Glass	720049	
	Handle	412586	
	Knob	480765A	On-Off Volume
	Knob	480795	Contrast
	Knob	480788	Brightness, Horiz. Hold, Vert. Hold.
	Knob	480795	Fine Tuning, Model 1232.
	Knob	480791	Fine Tuning, Model 1233.
	Knob	480784	VHF Channel Selector, Model 1232.
	Knob	480789	VHF Channel Selector, Model 1233.
	Knob	480790	UHF Channel Selector, Model 1233.
	Knob	480787	Radio, TV, Phono
	Knob	480786	Radio Tuning
	Cabinet	140807	Maroon
	Cabinet	140807A	Green
	Cabinet	140807B	Charcoal

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BC5	850K	0Ω	0Ω	.1Ω	†1300Ω	†1800Ω	0Ω		
V2	6AT8	15K	†6000Ω	0Ω	0Ω	.1Ω	†3000Ω	†6000Ω	0Ω	130K
V3	6CB6	850K	47Ω	0Ω	.1Ω	†1800Ω	†1800Ω	0Ω		
V4	6AM8	180Ω	1.4Ω	†1800Ω	0Ω	.1Ω	†1800Ω	.1Ω	4700Ω	0Ω
V5	6AW8	0Ω	2.6Meg	†28K	.1Ω	0Ω	●90Ω	500K	†6000Ω	†8200Ω
V6	6U8	†14K	27K	†18K	.1Ω	0Ω	†1800Ω	0Ω	6Ω	†1Meg
V7	6T8	100K	100K	150K	.1Ω	0Ω	▲440K	0Ω	2.2Meg	270K
V8	6AQ5	470K	470Ω	.1Ω	0Ω	†1400Ω	†1000Ω	470K		
V9	6CG7	●†700K	●1.1Meg	0Ω	0Ω	.1Ω	‡6500Ω	2.2Meg	●2000Ω	0Ω
V10	6CG7	●†25K	1.4Meg	300K	.1Ω	0Ω	†47K	370K	0Ω	0Ω
V11	6BQ6GT	TP	0Ω	TP	‡2400Ω	500K	TP	.1Ω	0Ω	TOP CAP ‡29Ω
V12	6AX4GT	NC	NC	350K	NC	50Ω	NC	0Ω	.1Ω	
V13	1V2	‡47Ω	PINS	2 THRU 8	HAVE	INFINITE	RESISTANCE			‡47Ω
V14	6BE6	22K	.8Ω	.1Ω	0Ω	▲†1300Ω	▲†4600Ω	▲3.8Meg		
V15	6BA6	▲3.8Meg	0Ω	0Ω	.1Ω	▲†1300Ω	▲†4600Ω	150Ω		
V16	8DP4	0Ω	10K	●180Ω	Pin 10 †47Ω	Pin 11 ●100K	Pin 12 .1Ω			

ALL MEASUREMENTS TAKEN IN TV POSITION UNLESS OTHERWISE NOTED.

‡ MEASURED FROM PIN 9 OF V12.

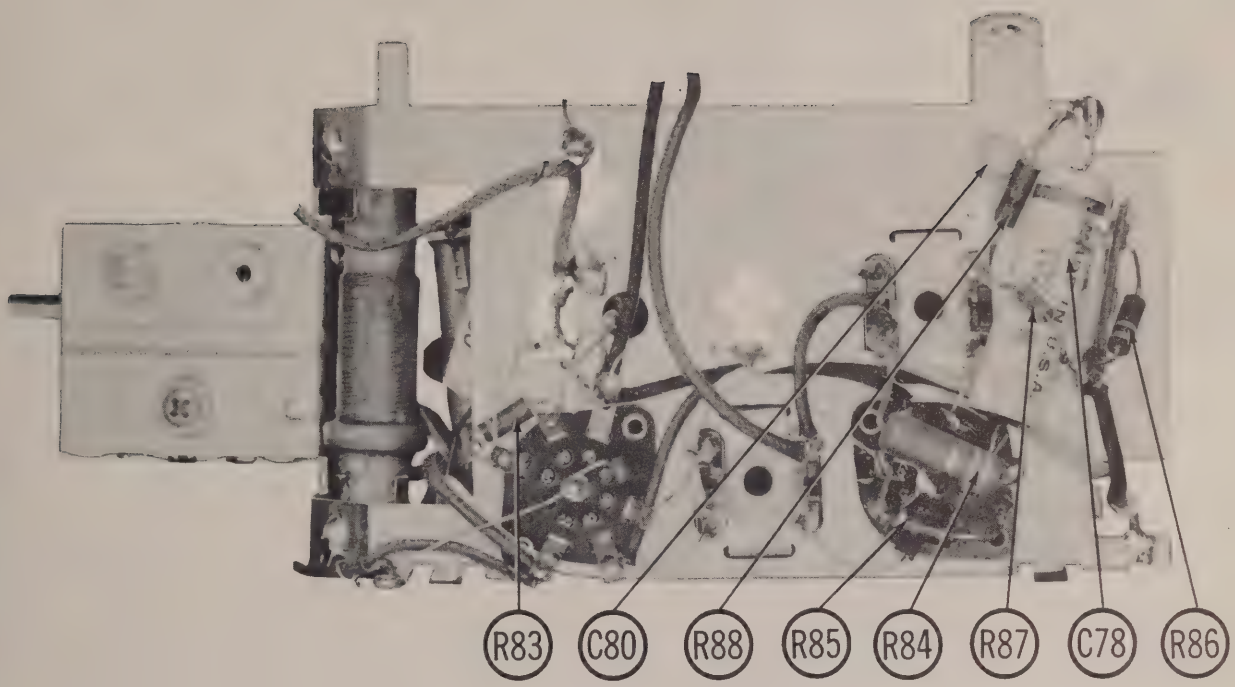
† MEASURED FROM OUTPUT OF M2.

● THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION.

▲ MEASURED IN RADIO POSITION.

NC NO CONNECTION

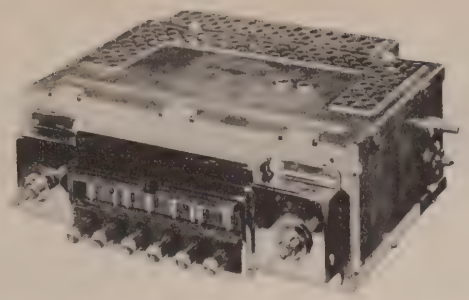
TP TIE POINT



RADIO CHASSIS BOTTOM VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Connect a short clip lead across the horizontal waveform coil (L21).
2. Turn horizontal hold control (R3) fully clockwise.
3. Starting with horizontal frequency slug (B1) fully clockwise (looking from rear of chassis), rotate counter clockwise until picture just locks into sync. Turn counter clockwise an additional 1/4 turn.
4. Remove clip lead from L21 and starting with horizontal waveform slug (B2) fully clockwise, rotate counter clockwise until picture almost locks into sync. (Two or three diagonal bars are present.)
5. Check for horizontal hold while switching from channel to channel. If picture does not lock-in with horizontal hold at fully clockwise, turn B1 counter clockwise SLIGHTLY until desired results are obtained. If excessive "Christmas tree effect" occurs, repeat steps 1 thru 5.



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TRADE NAME	Ford Model 79MS (FEJ-18806-C) For 1957 Ford Thunderbird Automobiles
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Ill.
TYPE SET	Battery Operated Custom Built AM Automobile Receiver With Transistorized Output.
TUBES (Nine)	Types 12AD6 RF Amp., 12AD6 Conv., 12AF6 1st IF Amp., 12BL6 2nd IF Amp., 12CR6 Det-AF Amp., 12K5 Driver, 12BL5 Pulse Rect., 12AE6 Trigger-AVC, 12K5 Relay Cont.
POWER SUPPLY	12 Volt Storage Battery — RATING 3 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540KC - 1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Tone control to "Treble".

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12AD6 (V2). Low side to chassis.	262.5KC (400~ Mod)	High frequency end stop.	DC probe to point A. Common to chassis.	A1, A2, A3	Adjust for maximum deflection.
2.	"	"	"	"	"	A4	Adjust for MINIMUM deflection.
3.	Fig. 1	Thru dummy to antenna receptacle.	1610KC	"	"	A5, A6, A7	Adjust for maximum deflection.
	Steps 4, 5 and 6 are not necessary except in case of tuner component replacement or if tuner has been tampered with. If necessary, back tuning cores out of coils 1 3/8" before proceeding with step 4.						
4.	Fig. 1	Thru dummy to antenna receptacle.	1610KC	High frequency end stop.	DC probe to point A. Common to chassis.	A5, A6, A7	Adjust for maximum deflection.
5.	"	"	1020KC	Back carriage 49/64" from high frequency end stop.	"	A8, A9, A10	Adjust for maximum deflection. See Fig. 2.
6.	"	"	1610KC	High frequency end stop.	"	A5, A6, A7	Adjust for maximum deflection.

With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum volume.

POINTER ADJUSTMENT

Tune receiver to 1000KC signal. Turn pointer adjusting cam until pointer is centrally located on 1000KC dial marking.

PUSHBUTTON ADJUSTMENT

1. Allow 15 minute warm-up period.
2. Unlock pushbuttons by turning them 2 turns counter clockwise.
3. Tune manually to desired station.
4. Press pushbutton in firmly; release carefully and lock by tightening with fingers.
5. Repeat on remaining pushbuttons.

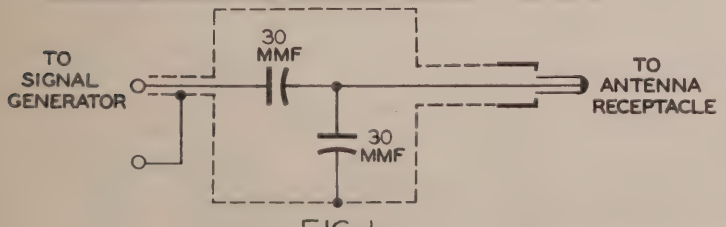


FIG. 1

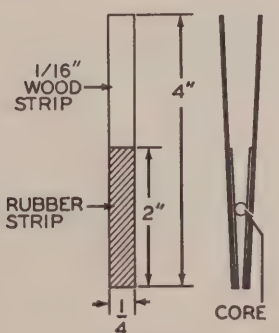


FIG. 2

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12AD6	
V2	Converter	12AD6	
V3	1st IF Amplifier	12AF6	
V4	2nd IF Amplifier	12BL6	
V5	Det-AF Amplifier	12CR6	
V6	Driver	12K5	
V7	Pulse Rectifier	12AL5	
V8	Trigger-AVC	12AE6	
V9	Relay Control	12K5	

TRANSISTORS

ITEM No.	USE	TYPE	NOTES
X1	Output	2N176	
X2	Output	2N176	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	500	16	23B537574						
B	100	16							
C2	500	3	23B539260	SRE3V500	BR500-6	TC605	TD-500-6	MTH-0650	TVA-1103
C3	500	3	23B539260	SRE3V500	BR500-6	TC605	TD-500-6	MTH-0650	TVA-1103
C4	10	50	23A632945	SRE50V10	BBR-10-50	TC32	TD-10-50	FM-0510	TVA-1304

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

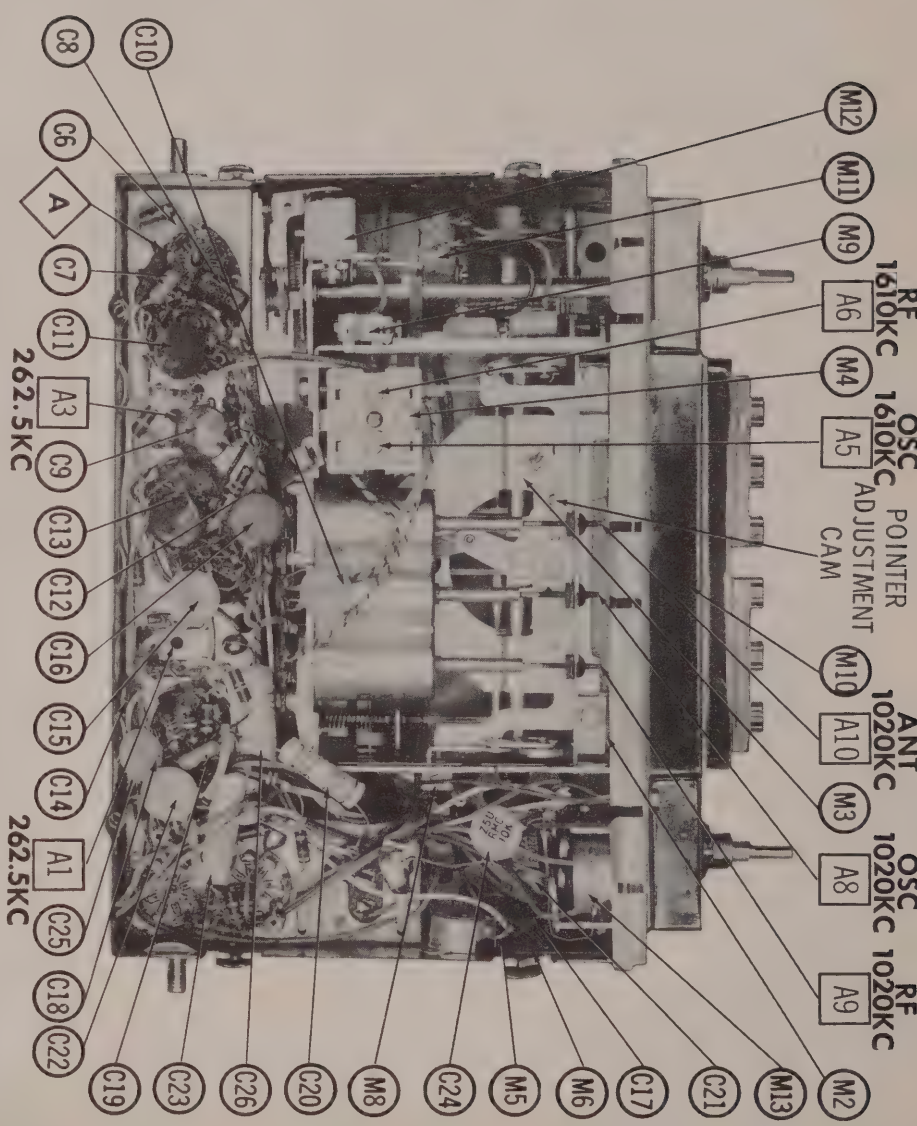
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	20-180		20B534809							
C6	10000		21R121946	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C7	33		21R120568	N750-S1 33	TCN-33	C10Q33U	TC7-33		5TCU-Q33	
C8	800		21K540465	BPD-0008	D6-801	L10T8	ED-800		5GA-T8	
C9	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C10	100		21R124032							
C11	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C12	220		21K121698	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C13	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C14	100		21R410036	N750-S1 100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	
C15	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C16	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C17	39		21R120569	BPD-000039	D6-390	L10Q39	ED-39	UC-5439	5GA-Q39	
C18	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C19	100		21R120576	N750-S1 100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	
C20	.001	600	8R122103	BPD-001	DD-102	CUB6D1	ED-001	GEM-621	6TM-D1	
C21	.02	200	8R121003	BPD-02	DD-203	CUB4S2	ED-02	GEM-412	4TM-S2	
C22	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C23	.02	200	21R120040	BPD-02	DD-203	CUB4S2	ED-02	GEM-412	4TM-S2	
C24	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C25	100		21R120576	N750-S1 100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	
C26	.05	200	8R121005	BPD-05	DD-503	CUB2S5		GEM-415	4TM-S5	
C27	5000	20000	21R120093			HVC20D5			20HK-D5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	4Meg	½	18K539481	F1-82	RTV-617C	*QJ-1034A	UE-3255	Tone
B	1Meg	½		R2-59	Not Req.	Not Req.	Not Req.	Volume, Tap③ 300K
R2	2000Ω	1	18K520298		39-2000		FL-2KS	Sensitivity, Town (Wire-wound)
R3	1000Ω	1	18K539684					Sensitivity, Normal (Wire-wound)
R4	125Ω	1	18K591265		39-125		FL-150	Transistor Bias (Wire-wound)
R5	500Ω	1	18K472182		39-500		FL-600	Bias (Wire-wound)

*Concentrikit Equivalent: Kit K-6; Base Elements and Shafts, B12-141, P14-112 (Panel)
B13-137X, R1-126 (Rear)

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R6	10Meg		6R5622	BTS-10Meg	
R7	820K		6R6429	BTS-820K	
R8	1.5Meg		6R3966	BTS-1.5Meg	
R9	4.7Meg		6R2122	BTS-4.7Meg	
R10	12K		6R6394	BTS-12K	
R11	47K		6R6056	BTS-47K	
R12	18K		6R5591	BTS-18K	
R13	2200Ω		6R6069	BTS-2200	
R14	100K		6R6075	BTS-100K	
R15	220K		6R6407	BTS-220K	
R16	1Meg		6R6046	BTS-1Meg	
R17	1000Ω		6R6229	BTS-1000	
R18	47K		6R6056	BTS-47K	
R19	27K		6R6434	BTS-27K	
R20	4.7Meg		6R6446	BTS-4.7Meg	
R21	1Meg		6R6004	BTS-1Meg	
R22	1000Ω		6R6301	BTS-1000	
R23	390Ω		6R5554	BTS-390	
R24	470Ω		6R6090	BTS-470	
R25	120K		6R5631	BTS-120K	
R26	82Ω		6R2035	BTS-82	
R27	3.3Meg		6R2118	BTS-3.3Meg	
R28	15Ω		6R2034	BTS-15	
R29	100K		6R6075	BTS-100K	
R30	560Ω		6R6291	BTS-560	
R31	3.9Meg		6R490110	BTS-3.9Meg	
R32	4.7Meg		6R6446	BTS-4.7Meg	
R33	3.3Meg		6R2118	BTS-3.3Meg	
R34	3.3Meg		6R6497	BTS-3.3Meg	
R35	10Ω		6R5621	BTS-10	
R36	3300Ω		6R6036	BTS-3300	
R37	330Ω		6R6010	BTS-330	
R38	470Ω		6R6090	BTS-470	
R39			6A539409		Note 1
R40	18Ω	1	6R118228	BTA-18	
R41	68Ω	2	6R118239		

Note 1: Special temperature compensation type, 35Ω @ 25°C.

TRANSFORMER (DRIVER)

ITEM No.	Turns Ratio		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	13 : 1	13 : 1	25B539327						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	33Ω CT	3-4Ω	25B539328						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	6" X 9"	PM	3-4Ω	50D538018	69A2	

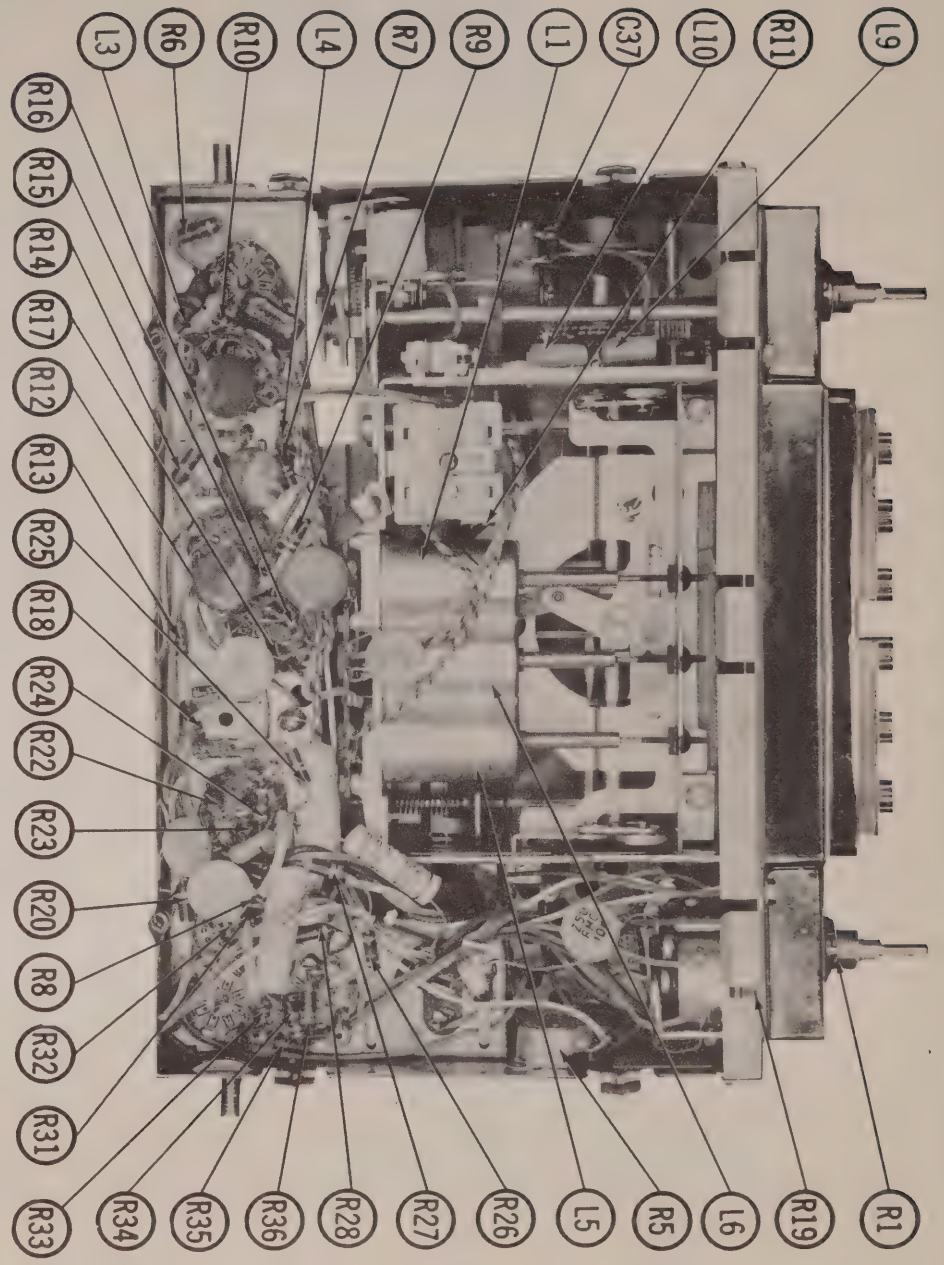
COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	24C536308				
L2	Ant. Loading Coil	24A532148	19-6033			31 Microhenries
L3	IF Trap	24C539614	19-3180	TV-184	6180	180 Microhenries
L4	IF Trap	24K539615				30 Microhenries
L5	RF Coil	24C536308				
L6	Osc. Coil	24B536300				
L7	Input IF	24B536693	16-6752	BC-350	12-H1	
L8	Output IF	24B533073				
L9	Search Motor Hash Choke	24A535789				3 Microhenries
L10	Search Motor Hash Choke	24A535789				3 Microhenries
L11	Fil. Choke	24K539382				125 Microhenries

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L12	3A	.65Ω	5.4Millithenry	25K539590					

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	7AG	7.5A 32V	65R122346	9K539880	30307.5 (7AG-7.5A)	155009	SFE 7½	HRH

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M2	Dial Light	65T533821	#1891
M3	Tuner	77K538929	(ST-202) Complete Ass'y.
M4	Trimmer Cap.	20B539612	Includes: A5 (Osc)120-220MMF, A6 (RF) 50-260MMF, 47MMF.
M5	Spark Plate	48A539147	Selenium. Alternate part #48K539953.
M6	Spark Plate	64K530177	
M7	Spark Plate	64A530176	
M8	Switch	40A536283	On-Off
M9	Switch	40B535396	Motor Reversing
M10	Switch	1V540692	Search Selector, Includes Buttons and Sensitivity Switch.
M11	Motor	59C535466	Tuner Drive
M12	Solenoid	59A537563	
M13	Relay	1V540128	Includes Mtg. Hardware.
	Pointer	1B536292	
	Glass	34C536273	Dial
	Knob	36A530011	Volume
	Knob	36B511457	Tone and Dummy
	Knob	36A538799	Tuning
	Pushbutton	38K536293	On-Off
	Pushbutton	1A536303	5 Used

ADJUSTMENTS

TOWN (R2)

Tune receiver for maximum noise output. Turn off receiver. Press and release Town Search Button. Short C11 to chassis. Connect a signal generator adjusted to 1000KC @ 100 microvolts to antenna receptacle thru dummy (refer align. Fig 1). Connect an output meter across speaker voice coil. Turn on receiver and generator and adjust R2 for 1.79 volts on output meter. (Volume control at maximum).

COUNTRY (R3)

Tune receiver for maximum noise output. Turn off receiver, press and release Country Search Button. Connect a signal generator adjusted to 1000KC @ 5 microvolts to antenna receptacle thru dummy (refer align Fig 1). Connect an output meter across speaker voice coil. Turn on receiver and generator and adjust R3 for 1.79 volts on output meter. (Volume control at maximum).

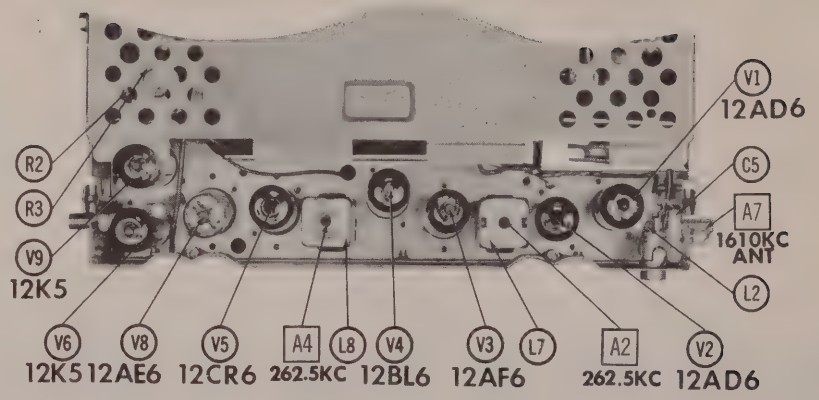
TRANSISTOR BIAS (R4)

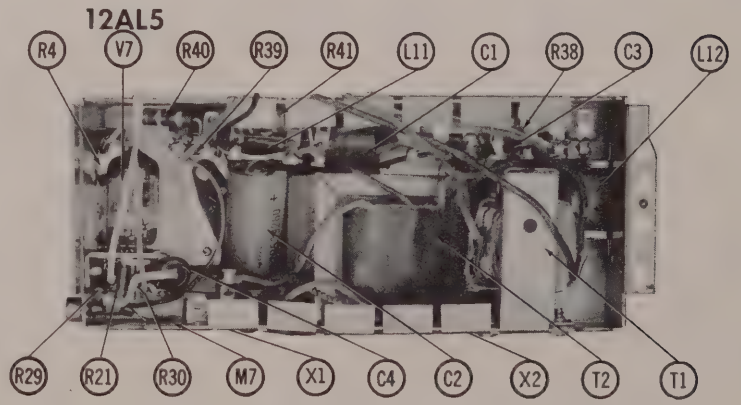
Separate the transistor mounting heat sink from the housing. Connect the positive lead of a low internal resistance milliammeter (.5Ω max) to the heat sink and the negative lead to the receiver chassis. Adjust R4 for 870 MA.

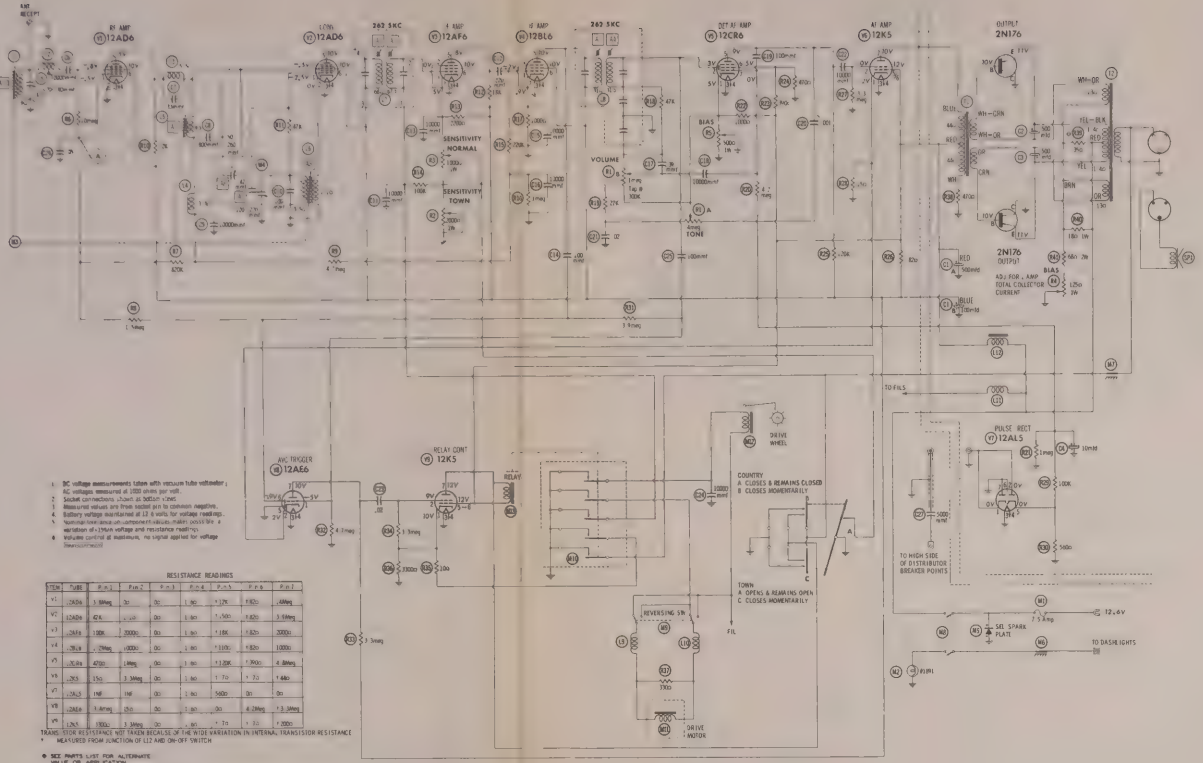
V5 CATHODE BIAS (R5)

Disconnect antenna and pulse rectifier (V7) input leads from receptacles. Use a VTVM and adjust R5 for a reading of 9 volts on the plate (pin 5) of the AF Amplifier (V5).

CHASSIS—TOP VIEW







1. DC voltage measurements taken with vacuum tube voltmeter.
2. AC voltages measured at 1000 ohms per volt.
3. Socket connections shown as bottom views.
4. Measured values are from socket pin to common negative.
5. Battery voltage maintained at 12.6 volts for voltage readings. Nominal line and component values may vary ± variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

Item	Type	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AD6	1.5Meg	0Ω	0Ω	1.8Ω	12K	82Ω	.6Meg
V2	12AD6	47K	0Ω	0Ω	1.8Ω	1.5Ω	82Ω	1.5Meg
V3	12AF6	100K	2000Ω	0Ω	1.8Ω	18K	82Ω	2000Ω
V4	12BL6	1.2Meg	1000Ω	0Ω	1.8Ω	110Ω	82Ω	1000Ω
V5	12CR6	470Ω	1Meg	0Ω	1.8Ω	13.2K	390Ω	4.8Meg
V6	12K5	15Ω	3.3Meg	0Ω	1.8Ω	1.7Ω	1.7Ω	1.6Ω
V7	12AL5	INF	INF	0Ω	1.8Ω	560Ω	0Ω	0Ω
V8	12AE6	1.4Meg	15Ω	0Ω	1.8Ω	0Ω	6.2Meg	1.3Meg
V9	12K5	100Ω	1.3Meg	0Ω	1.8Ω	1.7Ω	1.7Ω	100Ω

TRANSISTOR RESISTANCE NOT TAKEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE MEASURED FROM JUNCTION OF L12 AND ON-OFF SWITCH

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

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PHOTOFACT* Folder

*TRADE MARK

PACKARD-BELL MODELS 21DC3, 21DC4, 21DT2, 24DC2, 24DD2, 24DK2, 24DT2 (Ch. 98D2)

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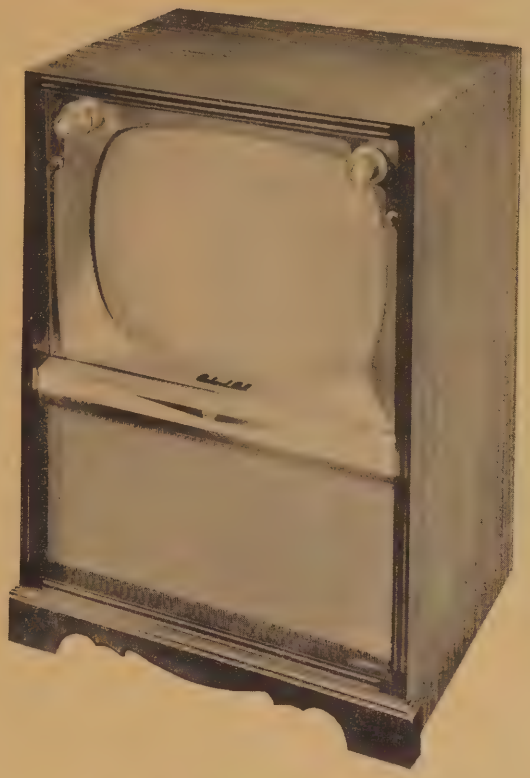

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PACKARD-BELL MODELS 21DC3, 21DC4, 21DT2, 24DC2, 24DD2, 24DK2, 24DT2 (Ch. 98D2)

PACKARD-BELL MODEL 21DC3 (Ch. 98D2)

TRADE NAME	Packard-Bell	MODELS	CHASSIS
		21DC3, 21DC4, 21DT2, 24DC2, 24DD2, 24DK2, 24DT2 ..... (All models are available with UHF tuning and the model number is followed by the suffix "-U", and they employ the same chassis with modifications.)	98D2
MANUFACTURER	Packard-Bell Co. -Service Div., 11th & Hope Streets, Los Angeles 15, Calif.		
TYPE SET	Television Receiver		
TUBES	Twenty-one		
POWER SUPPLY	110-120 Volts AC - 60 Cycles	RATING: 1.9 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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*TRADE MARK

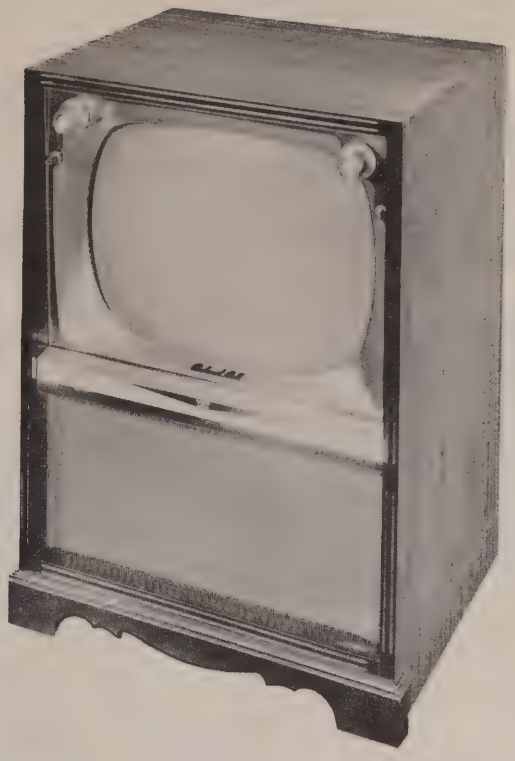
PACKARD-BELL MODELS 21DC3, 21DC4, 21DT2, 24DC2, 24DD2, 24DK2, 24DT2 (Ch. 98D2)

PACKARD-BELL MODELS 21DC3, 21DC4, 21DT2, 24DC2, 24DD2, 24DK2, 24DT2 (Ch. 98D2)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type control knobs.
2. Remove 7 wood screws, remove rear cover.
3. Remove 2 wood screws, remove antenna terminal board.
4. Remove 3 wood screws holding metal strip at bottom of safety glass.
5. Remove safety glass and mask.
6. Remove 4 hex nuts holding 2 control panels at top of picture tube.
7. Remove 1 metal screw holding strap to brace at top, rear of cabinet.
8. Remove 4 bolts from bottom of chassis.
9. Remove speaker plug from chassis.
10. Remove chassis.
11. Remove 8 wood screws holding 2 speakers.



MODEL	CHASSIS
21DC3	98D2

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SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

See steps 3, 4 and 5 of "Chassis Removal".

SPECIAL ADJUSTMENTS

A. Focus

The focus may be varied by means of a focus control. For location, see tube placement chart.

B. AGC

See "Video IF Alignment", step 10.

C. ANI

On strongest station in area, rotate ANI control maximum clockwise, rotate counter clockwise until picture distorts then clockwise SLIGHTLY to a point where distortion disappears.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Tune in a TV station and adjust horizontal hold until picture synchronizes horizontally.

FUSES

Two fuses are used for LV circuit protection. A $\frac{1}{2}$ amp. slo blo (see tube placement chart) and a 1 $\frac{1}{2}$" piece of #26 wire.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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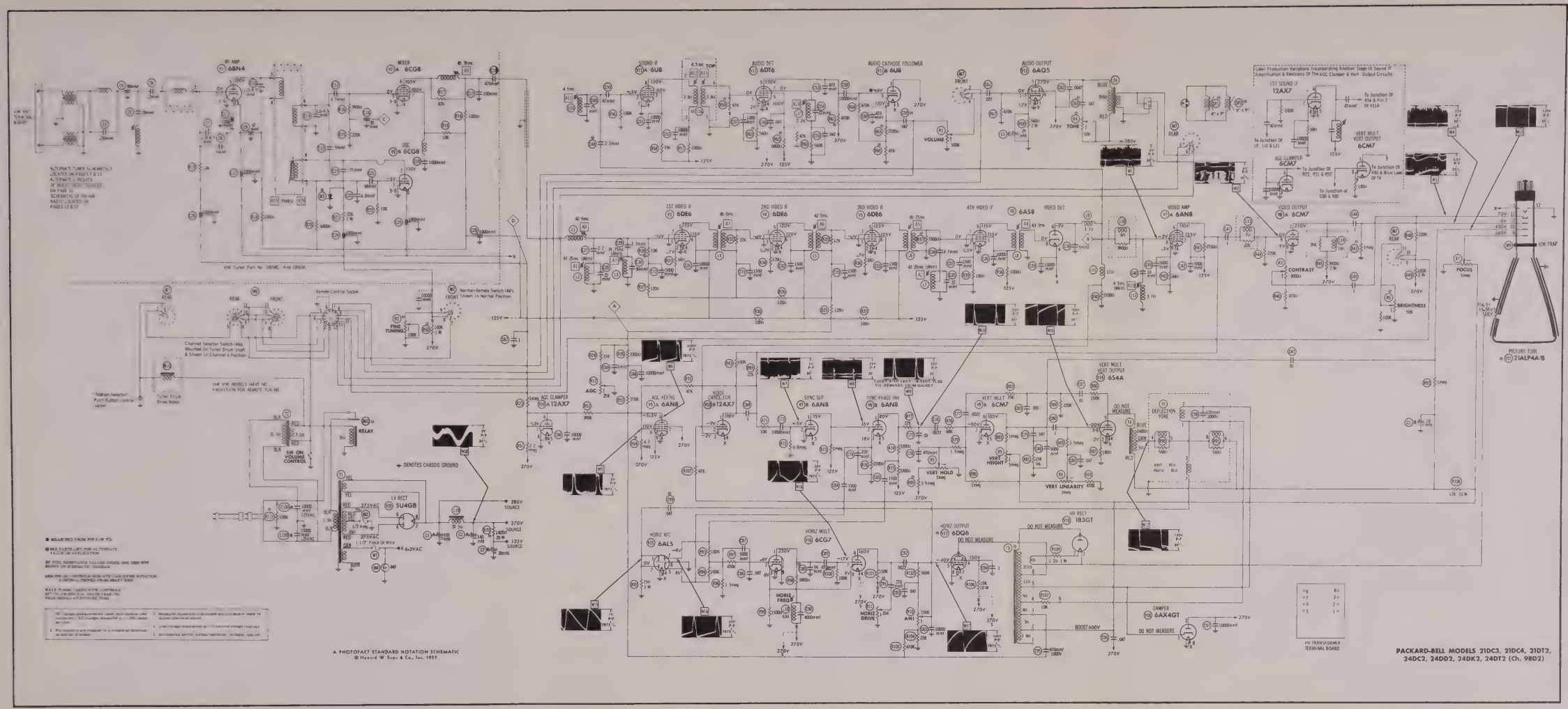
PACKARD-BELL MODELS 21DC3, 21DC4, 21DT2, 24DC2, 24DD2, 24DK2, 24DT2 (Ch. 98D2)
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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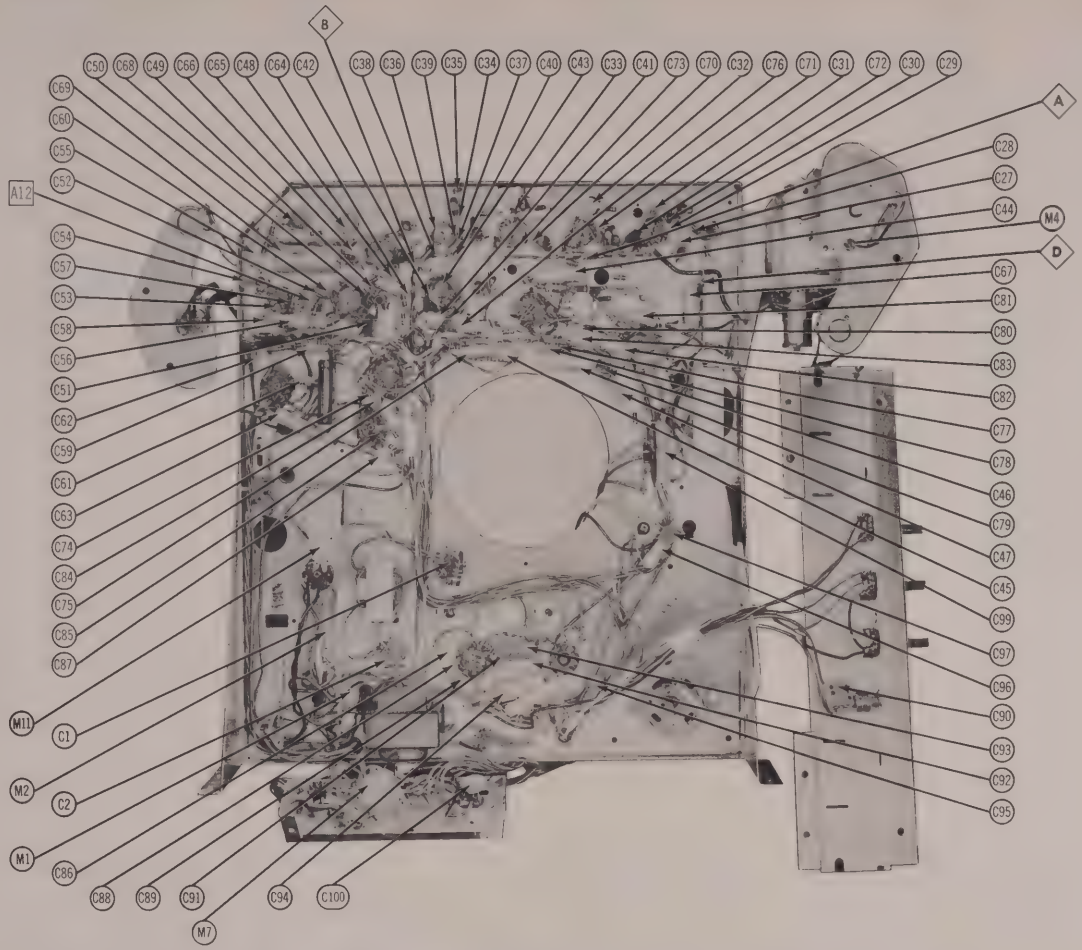
DENOTES CHASSIS GROUND
PICTURE TUBE 21ALP4A/B
ION TRAP
RELAY
SW ON VOLUME CONTROL
FINE TUNING
CONTRAST
BRIGHTNESS
FOCUS
VOLUME
TONE
VERT HOLD
VERT HEIGHT
VERT LINEARITY
HORIZ FREQ
HORIZ DRIVE
BOOST 600V
DO NOT MEASURE
DEFLECTION YOKE
HV TRANSFORMER TERMINAL BOARD

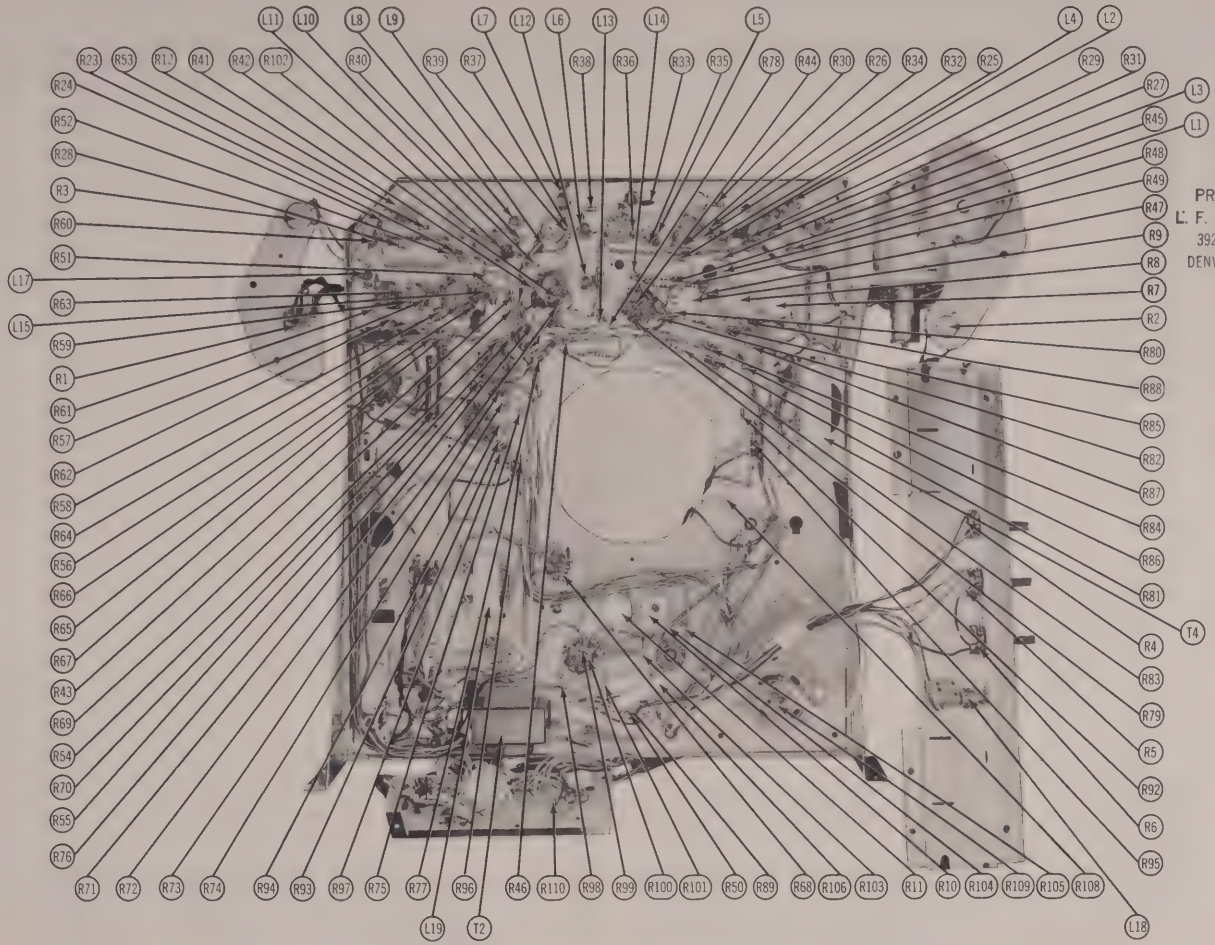
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CHASSIS TOP VIEW

PACKARD-BELL MODELS 21DC3, 21DC4, 21DT2, 24DC2, 24DD2, 24DK2, 24DT2 (Ch. 98D2)



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube (V16) from its socket to disable the high voltage.
Allow a 15 minute warm-up period for receiver and test equipment.

VIDEO IF ALIGNMENT

Remove the 12AX7 (V10) noise cancellor and AGC clamper, from its socket. Connect the negative lead of a 4. 5 volt bias supply to point Ⓐ. Positive to chassis. If a VHF tuner is being used in the set, connect the high side of the generator to point Ⓒ through a .001MFD blocking capacitor. Low side to chassis.
If a UHF-VHF tuner is being used in the set, connect the high side of the generator to an ungrounded tube shield floating over the mixer tube 6AT8. Connect the low side to chassis.
Set the generator output at maximum.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	See Instructions Above.		47. 25MC (unmod)	Any non-interfering channel.	DC probe to point Ⓑ. Common to chassis.	A1, A2	Adjust for MINIMUM deflection.
2.	"	"	39. 75MC	"	"	A3	"
3.	"	"	43. 3MC	"	"	A4	Adjust generator output to maintain approximately -2. 5 to -3 volts on VTVM. Adjust for maximum deflection.
4.	"	"	45. 75MC	"	"	A5	"
5.	"	"	42. 5MC	"	"	A6	"
6.	"	"	45. 0MC	"	"	A7	"
7.	"	"	42. 5MC	"	"	A8	"
8.	"	"	45. 35MC	"	"	A9	Adjust generator output to maintain approximately -2. 5 to -3 volts on VTVM. Adjust for maximum deflection. Repeat steps 1 thru 8.

OVERALL VIDEO IF RESPONSE CHECK

Connect a 1MFD 100 volt capacitor from point Ⓓ to chassis.
Adjust sweep generator output to produce a bias of -5 volts at point Ⓓ.
Connect the hot lead of a second signal generator to the ground lead of the IF input cable and leave the ground lead disconnected.
This will provide marker for response curve.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω carbon resistors	Across VHF antenna terminals with 120Ω in each lead.	63MC (10MC Swp)	41. 25MC 43. 0MC 45. 0MC 45. 75MC 47. 25MC	3	Vert. amp thru 22K to point Ⓑ. Low side to chassis.		Check for response similar to Fig. 1 with markers as indicated. Adjust A4 to correct the 43. 0MC marker. A7 will control the 45. 0MC marker and the 45. 75MC marker is controlled by adjusting A9. The 41. 25MC marker can be placed in the trap notch by adjusting A3. The 47. 25MC marker is corrected with A1 and A2.
10.	"	"	63MC (10MC Swp)	Not used.	"	USE VTVM DC probe to point Ⓐ. Common to chassis.	R12	Remove bias supply, marker generator and capacitor. Reduce generator sweep to zero but do not change generator output level. Adjust the AGC control (R12) to obtain 5½ volts reading on VTVM. This is the proper setting for normal operation, but in extreme fringe or high signal areas it may be necessary to readjust R12 to produce a MINIMUM of noise or interference. Replace V10 in its socket.

4.5MC TRAP ALIGNMENT

If a 4. 5MC signal generator of crystal control accuracy, capable of at least one volt output, is not available, tune in a TV station and adjust A10 for MINIMUM 4. 5MC beat interference in the picture.
Remove the 6AS8 (V6), 4th Video IF and video detector tube from its socket.
Turn contrast control fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.001MFD	High side to point Ⓑ. Low side to chassis.	4. 5MC (unmod)	Any	DC probe thru detector (Fig. 2) to pin 2 (grid) of picture tube. Common to chassis.	A10	Adjust A10 for MINIMUM deflection with a generator output of at least 1 volt. Replace V6.

SOUND IF ALIGNMENT

The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	.001MFD	High side to point Ⓑ. Low side to chassis.	4. 5MC (unmod)	Any non-interfering channel.	DC probe thru detector probe (Fig. 2) to pin 7 (grid 3) of 6DT6 (V12). Common to chassis.	A11, A12, A13	Reduce signal input to zero and detune A14 until the meter reading dips to zero. Increase signal input until an indication is obtained on the VTVM. Adjust A11 and A12 for maximum deflection. Reduce generator output to a low level and adjust A13 for maximum deflection. If A13 does not tune, or has a broad tuning peak, reduce generator output until sharp tuning is obtained. Remove the generator and connect the antenna. Tune in a TV station and adjust A14 for best sound. It may be necessary to retouch A11, A12 and A13 for best sound on a very weak TV signal.

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 47K to point (B). Low side to chassis.	A15	Adjust to place sound marker in trap notch as in Fig. 3. Video marker should fall at 50%.
			207MC (10MC Swp)	205. 25MC 209. 75MC	12		A16	
			201MC (10MC Swp)	199. 25MC 203. 75MC	11		A17	
			195MC (10MC Swp)	193. 25MC 197. 75MC	10		A18	
			189MC (10MC Swp)	187. 25MC 191. 75MC	9		A19	
			183MC (10MC Swp)	181. 25MC 185. 75MC	8		A20	
			177MC (10MC Swp)	175. 25MC 179. 75MC	7		A21	
			85MC (10MC Swp)	83. 25MC 87. 75MC	6		A22	
			79MC (10MC Swp)	77. 25MC 81. 75MC	5		A23	
			69MC (10MC Swp)	67. 25MC 71. 75MC	4		A24	
			63MC (10MC Swp)	61. 25MC 65. 75MC	3		A25	
			57MC (10MC Swp)	55. 25MC 59. 75MC	2		A26	

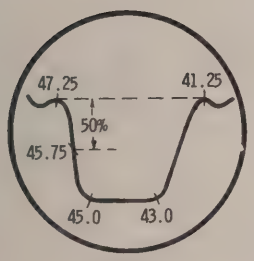


FIG. 1

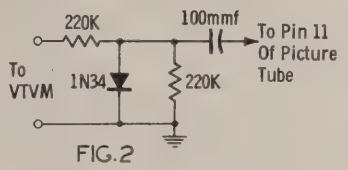


FIG. 2

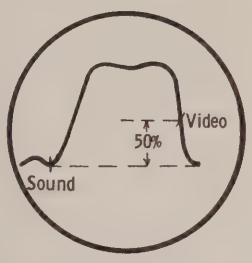
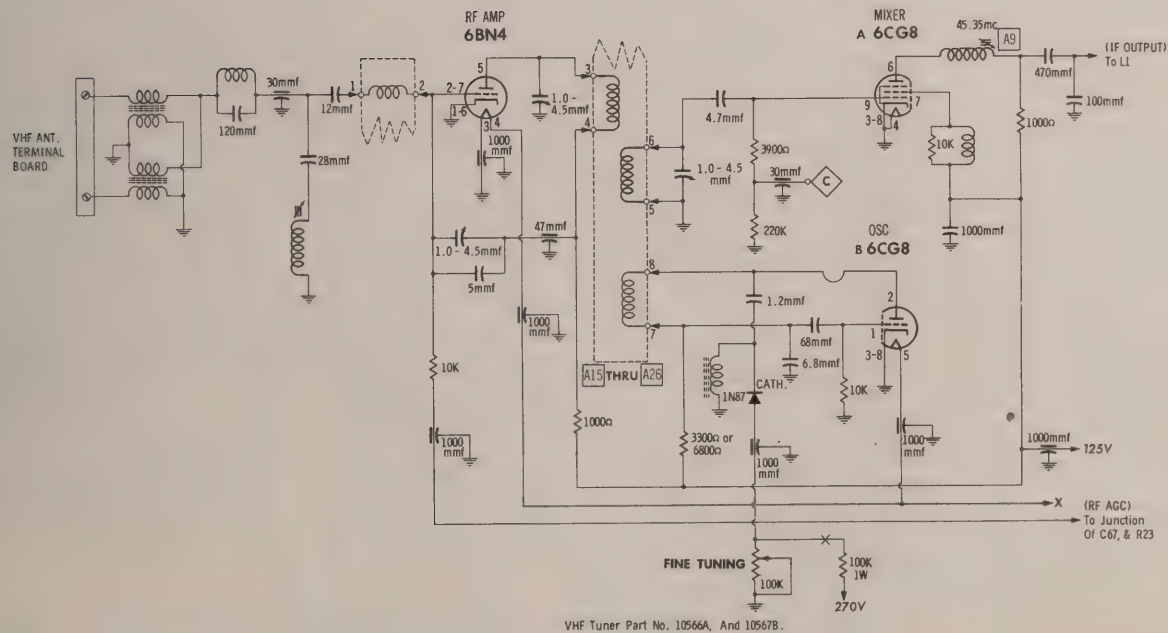


FIG. 3



VHF Tuner Part No. 10566A, And 10567B.

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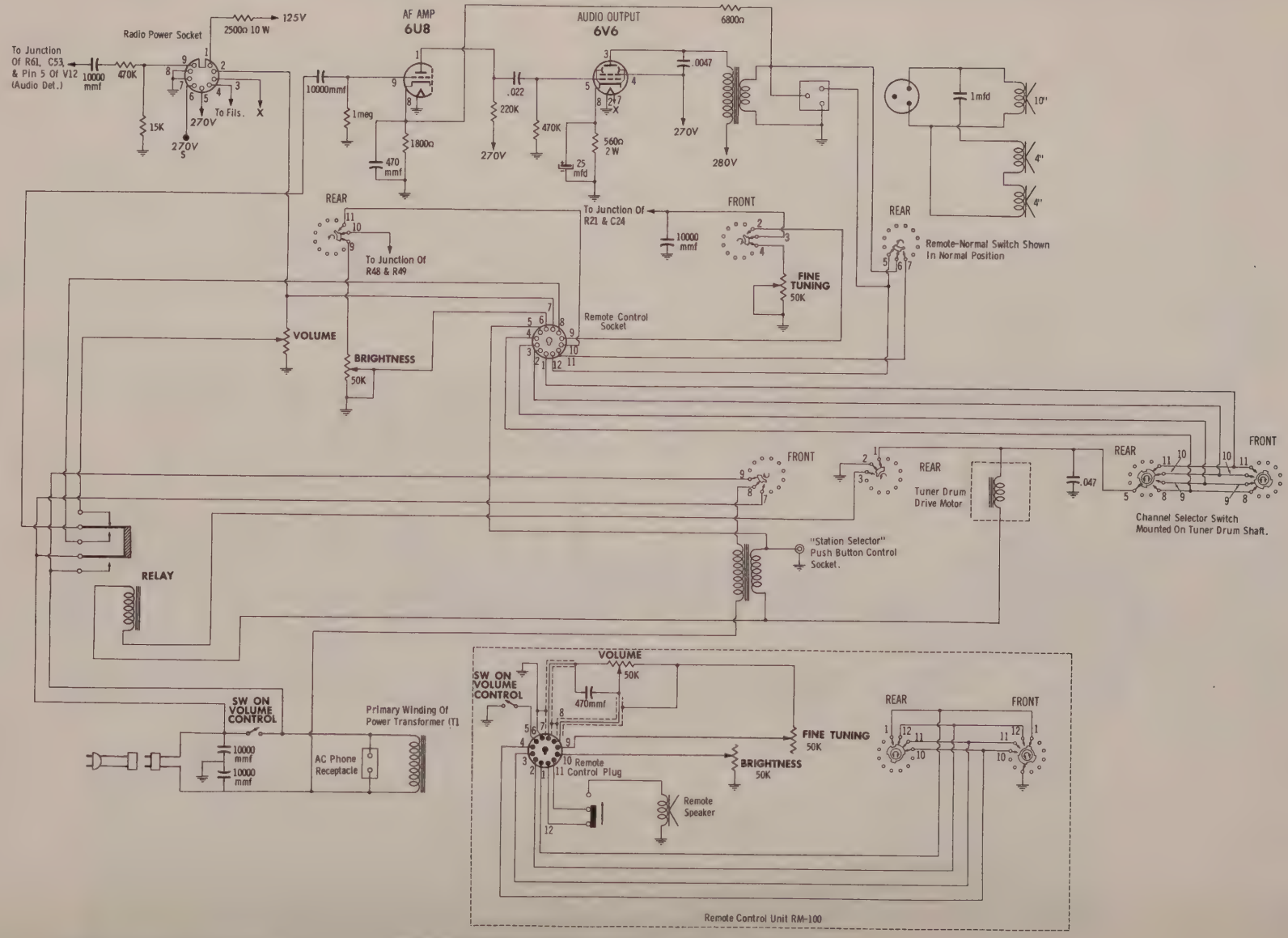
ALTERATE VHF TUNER SCHEMATIC



Radio Connections, Audio Output & Remote Control Switching Circuits Used In Model 24DK2

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ALTERNATE CIRCUITS MODEL 24DK2

TUBE PLACEMENT CHART

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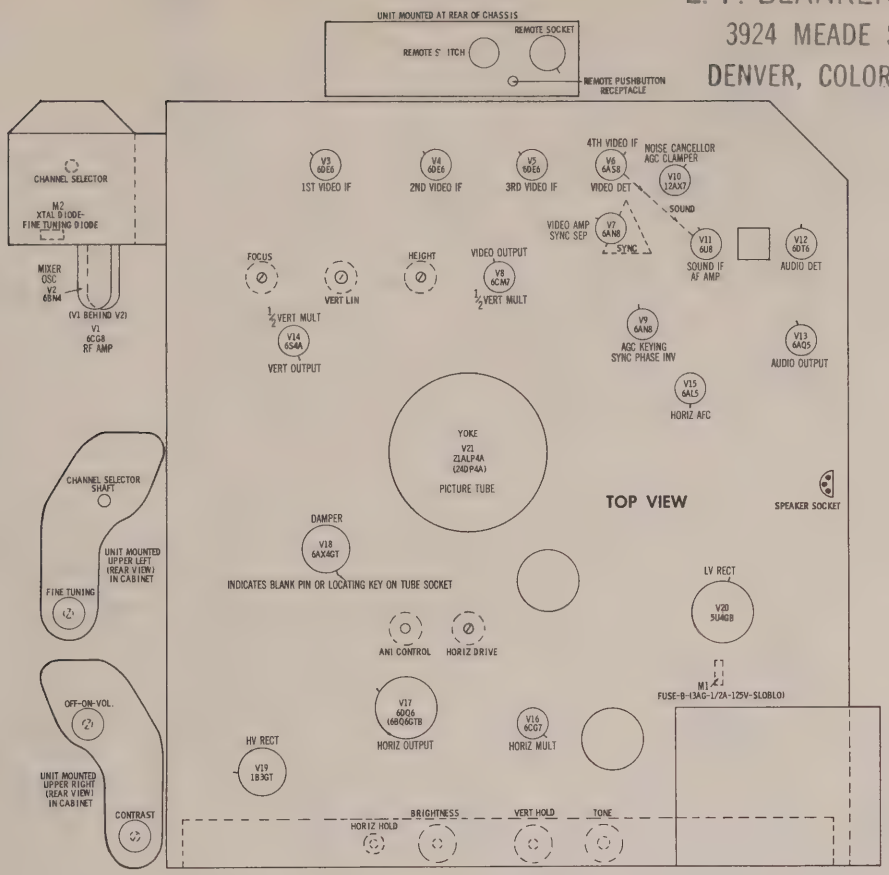


TUBE FAILURE CHECK CHART

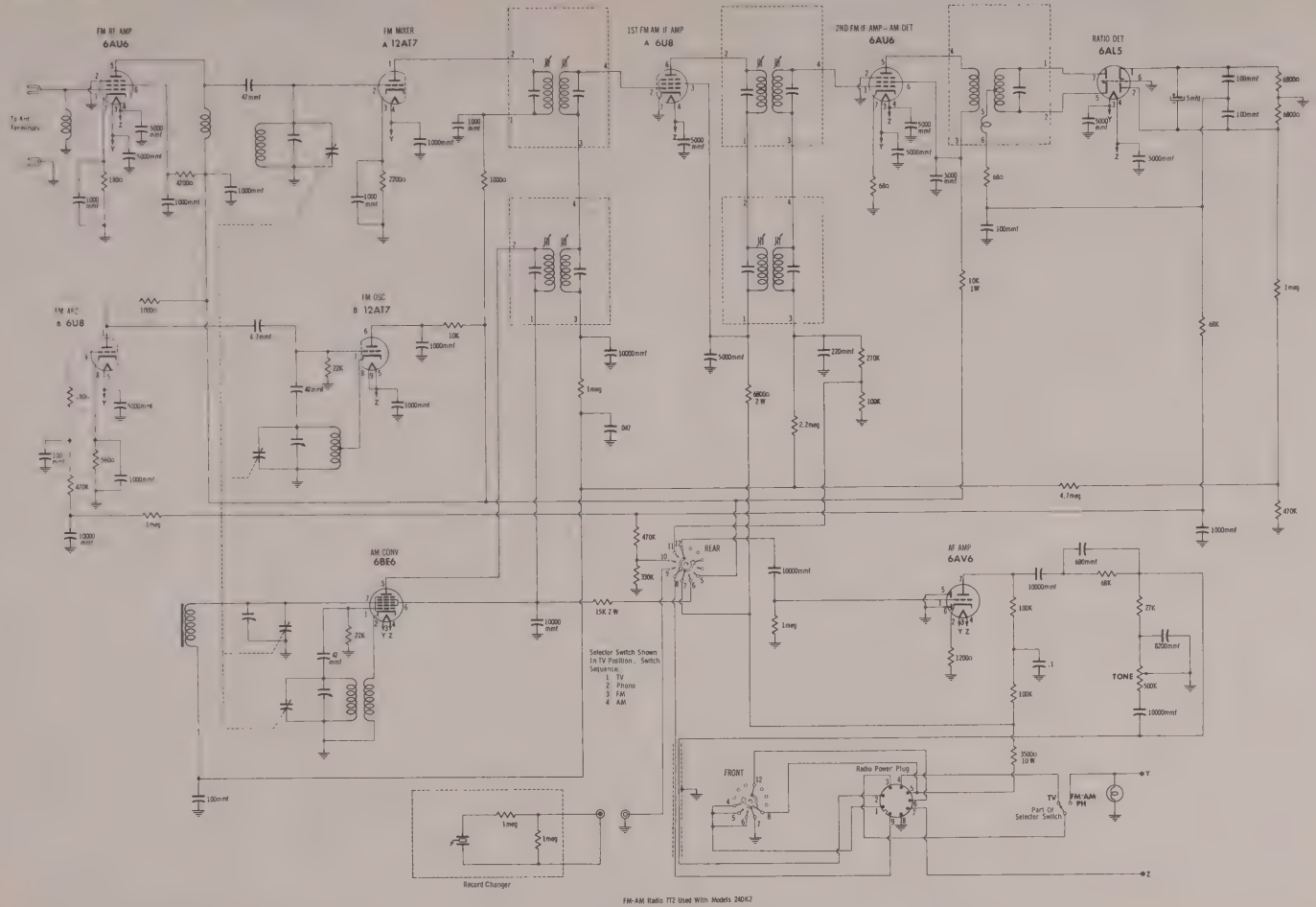
The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Fuse (M1, M2), V20**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6, V7, V8, V21**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V7, V8, V21**
Has pic, no sound - **V11, V12, V13**
Overloaded picture - **V9**

SYNC FAILURE
No vert. sync - **V10, V7, V9, V8, V14**
No horiz. sync - **V10, V7, V9, V15, V16**
No vert. or horiz. sync - **V10, V7, V9**

SWEEP FAILURE
No raster, has sound -**V15, V16, V17, V18, V19, V21**
No vertical deflection - **V8, V14**
Poor vert. linearity or foldover -**V8, V14**
Poor horiz. linearity or foldover - **V16, V17, V18**
Narrow picture - **V16, V17, V18, V20**
Vert. off freq. - **V10, V7, V9, V8, V14**
Horiz. off freq. - **V10, V7, V9, V15, V16**



FM-AM Radio 7T2 Used With Models 24DK2

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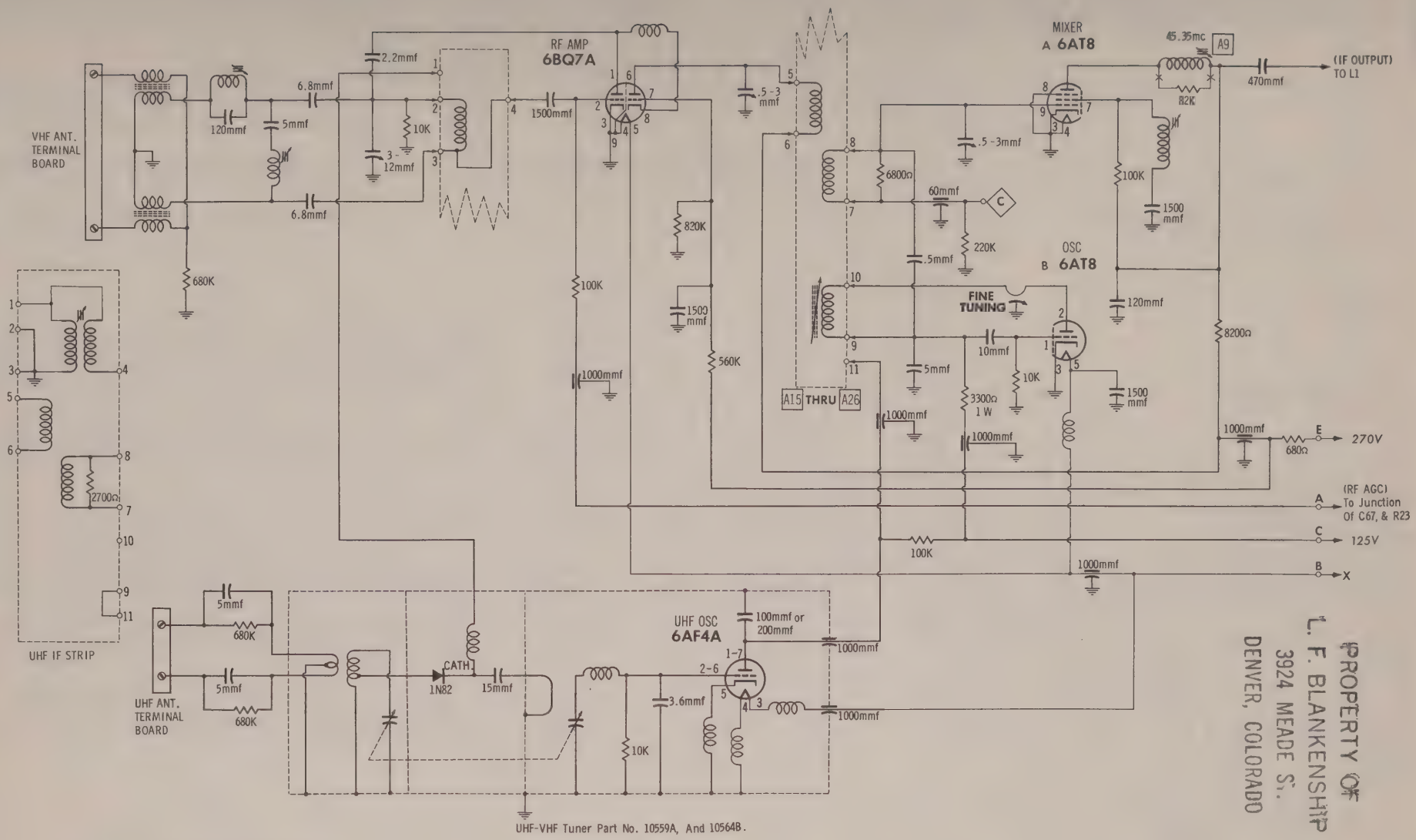
FM-AM RADIO SCHEMATIC



UHF-VHF Tuner Part No. 10559A, And 10564B.

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ALTERNATE UHF-VHF TUNER SCHEMATIC

PACKARD-BELL MODELS 21DC3, 21DC4, 21DT2, 24DC2, 24DD2, 24DK2, 24DT2 (Ch. 98D2)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amp.	6CG8	
V2	Mixer Osc.	6BN4	
V3	1st Video-IF Amplifier	6DJ8	
V4	2nd Video-IF Amplifier	6DJ8	
V5	3rd Video-IF Amplifier	6DJ8	
V6	Vert. Output	6BM4	Note 1
	Video Det.	6AL5	
V7	Video Amplifier-	6AN8	Note 2
	Sync Sep.		
V8	Video Output-Vert. Mult.	6CM7	
V9	AGC Keying	1SG7	
V10	Sync Phase Inverter	6AN8	
V11	Noise Canceller-		
	AGC Clamper	12AX7	Note 1

ITEM No	USE	TYPE	NOTES
V1	Sound IF Amplifier-		
	Audio Cathode Follower	6U8	
V12	Audio Detector	6DT6	
V13	Audio Output	6AQ8	
V14	Vert. Mult.-		
	Vert. Output	6BM4	Note 1
V15	Horiz. AFC	6AL5	
V16	Horiz. Mult.	6CG7	
V17	Horiz. Output	6DQ6	Note 2
V18	Damper	6AX4GT	
V19	HV Rectifier	1B3GT	
V20	LV Rectifier	5U4GB	

Note 1: In some versions V10, 12AX7 becomes noise canceller and sound IF amplifier, and V14 is changed to a 6CM7 and becomes vert. mult., vert. output and AGC clamper.
Note 2 6BQ6GTB may be used in some versions.

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	Packard-Bell Part No.	CBS Part No.	GENERAL ELECTRIC Part No.	SYLVANIA Part No.	
V21	21AL P4A/B	21ALP4A/B	21ALP4A/B	21ALP4A/B	1 Aluminalized 2 Silver Screen 85
		21ALP4B ①	21ALP4A ①		
		21ALP4	21ALP4	21ALP4	
	24DP4A	24DP4A ①	24DP4A ①	24DP4A ①	
		24DP4	24DP4	24DP4	

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						
	CAP	+VOLT	Packard-Bell Part No.	AEROVOX Part No.	CORNELL DUBILIER Part No.	MALLORY Part No.	PYRAMID Part No.	SANGAMO Part No.	SPRAGUE Part No.
C1A	■10	350	24093	AFH3-153-60		FP356	TMT-197	T-537	TVL-3808, 4
B	10	475				FP1000		MT-1219	
C	▲25	25							
C2A	▲10	350	24113	AFH3-29-75	DD044	FP330, 6	TMT-164	T-180	TVL-3845
B	▲20	350							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING		Packard-Bell Part No	REPLACEMENT DATA					NOTES
	CAP	VOLT		AEROVOX Part No.	CENTRALAB Part No.	CORNELL DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	
C3	130			MPO-S1-120	TCZ-130		TCO-130		5TCC-T13	
C4	50									
C5	26									
C6	12									
C7	10-4.5									
C8	5									
C9	4.7									
C10	10-4.5									
C11	1000									
C12	1000									
C13	4.7									
C14	10-4.5									
C15	5				TCZ-R5		TCO-5			
C16	50									
C17	100			MPO-S1 100	TCZ-100	C107C	TCO-100	ST-531	5TCC-T1	
C18	500			BYA0D47	BYA0D47	BYA0D47	ED-1500	UC-5247	5HK-D1	
C19	1000			BYP0-001	BYP0-001	BYA6DI	ED-1000	DCS21	5HK-D1	
C20	1000									
C21	68								2T-5875	
C22	6 B									
C23	75									
C24	1000									
C25	1000									
C26	1000									
C27	2.2			MPO-S1 2.2	TCZ-2R2	C10V22C	TCO-2.2		5TCCP-V22	
C28	27			MPO-S1 22	TCZ-22	C10Q22C	ED-33	UC-5422	5GA-Q22	
C29	2.2			MPO-S1 2.2	TCZ-2R2	C10V22C	TCO-2.2		5TCCP-V22	
C30	30			MPO-S1 30	TCZ-300	C10Q3C	ED-30		5GA-Q30	
C31	10000			BYP0-01	BYA0D1	GP-10000		DCS11	5HK-B1	
C32	1500			BYP0-015	BYA0D15	ED-1500		DCS215	5HK-D15	
C33	1500			BYP0-0015	BYA0D15	ED-1500		DCS215	5HK-D15	
C34	4.7			MPO-S1 4.7	TCZ-4R7	C10V47C	TCO-4.7	ZT-5547	5TCCP-V47	
C35	22			MPO-S1 22	TCZ-22	C10Q22C	ED-33	UC-5422	5GA-Q22	
C36	10000			BYP0-01	BYP0-001	BYA6DI	GP-10000	DCS11	5HK-B1	
C37	1500			BYP0-015	BYP0-0015	BYA0D15	ED-1500	DCS215	5HK-D15	
C38	5			MPO-S1 5	TCZ-5	C10V5C	ED-5	ZT-555	5GA-V5	
C39	10000			BYP0-01	BYP0-001	BYA6DI	GP-10000	DCS11	5HK-B1	
C40	1			MPO-S1 1	TCZ-1R0	C10V1C	TCO-1.0	ZT-541	5TCC-Q1	
C41	1500			P568N-1	DF-104	CU84P1		GEM-502	5TM-P1	
C42	3500			BYP0-005	BYP0-0015	BYA0D15	GP-1500	DCS215	5HK-D15	
C43	5000			BYP0-005	BYP0-002	BYA3D5	GP-5000	DC535	5HK-D5	
C44	1	600		P568N-1	DF-104	CU84P1		GEM-501	5TM-P1	
C45	1	400		P568N-1	DF-104	CU84P1		GEM-401	4TM-P1	
C46	5000			BYP0-005	BYP0-002	BYA3D5	GP-5000	DC535	5HK-D5	
C47	1	600		BYP0-01	BYP0-001	CL84S1		GEM-611	6TM-S1	
C48	2.2			MPO-S1 2.2	TCZ-2R2	C10V22C	TCO-2.2		5TCCB-V22	Note 1
C49	75			W750-S1 75	TCZ-750	C10Q75C	TC-75	ST-5475	5TCCU-Q75	
C50	47			BYP0-00047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C51	10000			BYP0-01	BYP0-001	BYA6SI	GP-10000	DCS11	5HK-B1	
C52	10000			BYP0-01	BYP0-003	BYA6SI	GP-10000	DCS11	5HK-B1	
C53	470			BYP0-00047	BYP0-471	BYA1U147	ED-470	UC-5347	5GA-T47	
C54	33			MPO-S1 33	TCZ-330	C10Q33C	ED-33	UC-5433	5GA-Q33	
C55	047	200		BYP0-05	DF-503	CU84S47		GEM-2147	2TM-S47	
C56	047	400		BYP0-05	DF-503	CU84S47		GEM-2147	4TM-S47	
C57	1000			BYP0-001	BYP0-102	BY6SD1	ED-1000	DCS21	5HK-D1	
C58	10000			BYP0-01	BYP0-103	BY6SI	GP-10000	DCS11	5HK-B1	
C59	047	400		BYP0-05	DF-503	CU84S47		GEM-4147	4TM-S47	Note 2
C60	470			BYP0-00047	DD-471	BYA1U147	ED-470	UC-5347	5GA-T47	
C61	033	100		BYP0-02	DD-303	CU83S33		GEM-5133	2TM-S33	
C62	0047	600		BYP0-0047	DD-472	CU86D47		GEM-6247	6TM-D47	
C63	047	600		BYP0-05	DF-503	CU86S47		GEM-6147	6TM-S47	Note 3
C64	▲	200		P568N-1	DF-104	CU82P1		GEM-201	2TM-P1	
C65	10000			BYP0-01	BYP0-103	BY6SI	GP-10000	DCS11	5HK-B1	
C66	10000			BYP0-01	BYP0-103	BY6SI	GP-10000	DCS11	5HK-B1	
C67	1	200		P568N-1	DF-104	CU82P1		GEM-201	2TM-P1	

ITEM No	RATING		Packard-Bell Part No	REPLACEMENT DATA					NOTES
	CAP	VOLT		AEROVOX Part No.	CENTRALAB Part No.	CORNELL DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	
C68	10000			BPD-01	DD-103	BYA6SI	GP-10000	DCS11	5HK-S1	
C69	100	100		BY88N-1	DE-104	CU82P1		GEM-101	1TM-P1	
C70	1500			BPD-0015	DD-152	BYA3D15	KD-1500	DCS215	5HK-D15	
C71	1500			BPD-0015	DD-152	BYA3D15	ED-1500	DCS215	5HK-D15	
C72	5000			BPD-005	DD-502	BYA3D5	GP-5000	DC535	5HK-D5	
C73	10000			BPD-01	DD-103	BYA6SI	GP-10000	DCS11	5HK-S1	
C74	1200			BPD-00022	DD-221	BYA1U122	ED-330	UC-5322	5GA-T22	
C75	91	600		BPD-01	DD-104	CU86S1		GEM-611	6TM-S1	
C76	0033	600		BPD-03	DE-322	CU86D33		GEM-6233	6TM-D33	
C77	.0033	400		BPD-0022	DE-222	CU84D22		GEM-4222	4TM-D22	
C78	470			BPD-00047	DD-471	BYA1U147	ED-470	UC-5347	5GA-T47	
C79	.047	600		BPD-05	DF-503	CU86S47		GEM-6147	6TM-S47	
C80	.1	600		P568N-1	DF-104	CU86P1		GEM-601	6TM-P1	
C81	047	200		BPD-05	DF-503	CU83S47		GEM-2147	2TM-S47	
C82	.01	600		BPD-01	DD-103	CU86S1		GEM-611	6TM-S1	
C83	.01	600		BPD-001	DD-102	CU86D1		GEM-621	6TM-D1	
C84	1500			BPD-0015	DD-152	BYA0D15	KD-1500	DCS215	5HK-D15	
C85	1500			BPD-0015	DD-152	BYA0D15	ED-1500	DCS215	5HK-D15	
C86	.047	200		BPD-05	DF-503	CU83S47		GEM-2147	2TM-S47	
C87	5000			BPD-005	DD-502	BYA3D5	GP-5000	DC535	5HK-D5	
C88	56			1488-00056		5WSQ56		MS-4656	MS-4656	Note 4
C89	470			1488-00047		5WST47		MS-347	MS-347	
C90	4000					1N124		MC483	MC-24	
C91	270			BPD-00027	DD-271	BYA1U127	ED-270	UC-5327	5GA-T27	Note 5
C92	.0022	600		BPD-0022	DE-222	CU86D22		GEM-6222	6TM-D22	
C93	.047	200		BPD-05	DF-503	CU83S47		GEM-2147	2TM-S47	
C94	.1	600		P568N-1	DF-104	CU86P1		GEM-601	6TM-P1	
C95	470	1000		BYD-15-470	DD-471	BYA1U147		10DAB-T47	10DAB-T47	
C96	.047	600		BPD-05	DF-503	CU86S47		GEM-6147	6TM-S47	
C97	10000			BPD-01	DD-103	BYA6SI	GP-10000	DCS11	5HK-S1	
C98	120	2000			DDD-121	BYD0T12			20GA-T12	
C99	.047	600		BPD-05	DF-503	CU86S47		GEM-6147	6TM-S47	Note 6
C100A	10000	125VAC	23982-A	DAC-37	DD06-103	BYE1S6		GEM-1651	MB-51	
B	10000	125VAC		DAC-27	DD06-103	BYE1S6		GEM-1651	MB-51	

Note 1: Some versions may use 47MMF (10% NPO) in this application.
Note 2: Some versions may use .22MFD @ 30V in this application and it is not used in model 24DK2.
Note 3: Not used in model 24DK2.
Note 4: Later versions may use 51MMF (5% NPO) in this application.
Note 5: Later versions may use 330MMF in this application.
Note 6: Later versions may use .1MFD @ 600V in this application.

CONTROLS

ITEM No	RATING		Packard-Bell Part No	REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS		CENTRALAB Part No	CLAROSTAT Part No	IRC Part No	MALLORY Part No	
R1A	500K	1	25922C	B-50-S	A47-500K-2	Q13-139	U48	Volume
B	Shaft			Not Req.	FS-2	Not Req.	Not Req.	
C	Switch			Not Req.	SWS-13	76-1	US-28	
R2A	100K	1	25925	AB-61	A47-100K-2	Q13-138	U39	Fine Tuning - Notes 1 & 2
B	Shaft			AK-4	BSS-3	Not Req.	Not Req.	
R3A	3000Ω	1	25919			Q17-118		Contrast
B	Shaft					Not Req.		
R4A	50K	1	25930	AB-31	A47-50K-S	Q11-123	U30	Tone - Note 3
B	Shaft			AK-4	BSS-3	Not Req.	Not Req.	
R5A	3Meg	1	25923	AB-85	A47-3Meg-Z	Q13-140	U57	Vert. Hold
B	Shaft			AK-4	BSS-3	Not Req.	Not Req.	
R6A	50K	1	25930	AB-31	A47-50K-S	Q11-123	U35	Brightness - Note 4
B	Shaft			AK-4	BSS-3	Not Req.	Not Req.	
R7A	5Meg	1	25910	AB-87	A47-5Meg-S	BU-140	PTA5SL	Focus
B	Shaft			AK-1	FKS 1/4	TM1-KIT	Not Req.	
R8A	3Meg	1	25807	AB-84	A47-3Meg-S	BU-140	TA35L	Vert. Lin.
B	Shaft			AK-1	FKS 1/4	TM1-KIT	Not Req.	
R9A	5Meg	1	25910	AB-87	A47-5Meg-S	BU-140	PTA5SL	Vert. Height
B	Shaft			AK-1	FKS-1/4	TM1-KIT	Not Req.	
R10A	150K	1	25921A	AB-43	A47-150K-S	BU-128	TA184L	ANI
B	Shaft			AK-1	FKS-1/4	TM1-KIT	Not Req.	
R11A	25K	1	25857	AB-28	A47-25K-S	BU-120	TA253L	Horiz. Drive
B	Shaft			AK-1	FKS-1/4	TM1-KIT	Not Req.	
R12A	25K	1	25857	AB-28	A47-25K-S	BU-130	TA283L	AGC
B	Shaft			AK-1	FKS-1/4	TM1-KIT	Not Req.	

Note 1: This control is used as a brightness control in VHF models.
Note 2: Some versions may use a 50K ½ watt control part #25945 in this application.
Note 3: Not used in model 24DK2.
Note 4: Not used in VHF models and R3 becomes the brightness control.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING		REPLACEMENT DATA Packard-Bell Part No	IRC Part No	NOTES
	OHMS	WATT			
R13	10K			BTS-10K	
R14	10000			BTS-10K	
R15	220K			BTS-220K	
R16	39000			BTS-39K	
R17	833			BTS-833K	
R18	10000			BTS-10000	
R19	10K			BTS-10K	
R20	68000			BTS-68K	
R21	22K	1		BTA-22K	
R22	10K			BTS-10K	
R23	1Meg			BTS-1Meg	
R24	15K			BTS-15K	
R25	1200			BTS-120	
R26	1200			BTS-120	
R27	1200			BTS-120	
R28	3300Ω			BTS-3300	
R29	10K				Note 1
R30	68Ω			BTS-100	
R31	68Ω			BTS-68	
R32	22K				
R33	100Ω			BTS-100	
R34	120Ω			BTS-120	
R35	12K				
R36	68Ω			BTS-68	
R37	33000			BTS-3300	Note 1
R38	1000Ω			BTS-1000	
R39	180Ω			BTS-180	
R40	2700Ω			BTS-2700	
R41	2700Ω			BTS-2700	
R42	68Ω			BTS-68	
R43	100K			BTS-100K	
R44	330K			BTS-330K	

ITEM No	RATING		REPLACEMENT DATA Packard-Bell Part No	IRC Part No	NOTES
	OHMS	WATT			
R45	3900Ω	2		BTS-3900	
R46	4700Ω			BTS-470	
R47	1Meg			BTS-1Meg	Note 2
R48	220K			BTS-220K	
R49	100K	1		BTA-100K	Note 3
R50	100K	1		BTA-100K	Note 3
R51	2.2Meg			BTS-2.2Meg	
R52	390K			BTS-390K	
R53	270K			BTS-270K	
R54	4.7Meg			BTS-4.7Meg	Note 4
R55	47K			BTS-47K	
R56	100K			BTS-100K	
R57	1000Ω			BTS-1000	
R58	33K			BTS-33K	
R59	47K			BTS-47K	Note 5
R60	560K			BTS-560K	
R61	470K			BTS-470K	Note 5
R62	6800Ω			BTS-6800	Note 5
R63	560Ω			BTS-560	Note 7
R64	470K			BTS-470K	
R65	2700Ω			BTS-2700	Note 8
R66	47K			BTS-47K	Note 8
R67	470K			BTS-470K	
R68	560Ω	2		BTS-560	
R69	33K			BTS-33K	
R70	1600Ω	20	73830	ID-1600	Note 10
R71	91K			BTS-91K	
R72	6.8Meg			BTS-6.8Meg	
R73	1Meg			BTS-1Meg	
R74	3300Ω			BTS-3300	
R75	330Ω			BTS-330	
R76	2700Ω			BTS-2700	

RESISTORS (cont)

ITEM No	RATING		REPLACEMENT DATA Packard-Bell Part No	IRC Part No	NOTES
	OHMS	WATT			
R77	22K			BTS-22K	
R78	68K			BTS-68K	
R79	.5Meg			BTS 1.5Meg	
R80	1Meg			BTS-1Meg	
R81	15K 5%			BTS-15K 5%	
R82	1Meg			BTS 1Meg	
R83	33K			BTS-33K	
R84	220K			BTS 220K	
R85	1.5Meg			BTS 1.5Meg	
R86	150K			BTS-150K	
R87	180Ω			BTS-180	
R88	470K			BTS-470K	
R89	2.5Meg			BTS-3.9Meg	Note 11
R90	560Ω				
R91	560Ω				
R92	1Meg			BTS-1Meg	
R93	100K				

ITEM No	RATING		REPLACEMENT DATA Packard-Bell Part No	IRC Part No	NOTES
	OHMS	WATT			
R94	100K				
R95	150	1			
R96	1.5Meg				
R97	100K				
R98	68000				
R99	1500				
R100	100K				
R101	150K				
R102	47K				
R103	560K				
R104	33K				
R105	470K				
R106	10K	10		PW10-10K	
R107	10K	10		BTS-10K	
R108	12K	10		1 2.4A-12K	
R109	1.2Ω	1		PW1-1.2	
R110	130K			BTS-100K	Note 3

Note 1: Some versions may use 47000 in this application.
Note 2: Some versions may use 47K or 220K in this application.
Note 3: Not used in some versions.
Note 4: Some versions may use 5.9Meg in this application.
Note 5: Model 24DK2 uses a 270K in this application.
Note 6: Some versions may use 22K, 2W in this application.
Note 7: Some versions may use 820Ω in this application.
Note 8: Not used in model 24DK2.
Note 9: Model 24DK2 uses 1800Ω in this application.
Note 10: Some versions may use 1800Ω, 30W in this application.
Note 11: Some versions may use 3.3Meg in this application.

TRANSFORMER (POWER)

ITEM No	RATING				REPLACEMENT DATA Packard-Bell Part No.	Halldorson Part No	Merit Part No	Stancor Part No	Thordarson Part No	Triad Part No
	PRI.	SEC. 1	SEC. 2	SEC. 3						
T1	117VAC 50-60	550VCT .5A @ 375A	5V @ 3A	6.3V @ 9A	89058C					

TRANSFORMER (MOTOR)

ITEM No	RATING				REPLACEMENT DATA Packard-Bell Part No.	Halldorson Part No	Merit Part No	Stancor Part No	Thordarson Part No	Triad Part No
	PRI.	SEC. 1	SEC. 2	SEC. 3						
T2	117VAC 60 @ .3A	24VAC @ 1.7A			89080 ①					

① Not used in UHF models.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA Packard-Bell Part No.	Halldorson Part No.	Merit Part No.	RCA Part No.	Ram Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.
T3	Horiz. Output Trans.	89458B	FB420* ①	HVO-54* ①	X129* ①	A-8255* ①	FLY-7P ①	D-49* ①	
T4	Vert. Output Trans.	89454C	FB420* ①	HVO-54* ①	X129* ①	A-8255* ①	FLY-7P ①	D-49* ①	
T5A	Yoke(90°)Horiz(25MH)	21406	A-3039	22811	V312	A-8255 ①	26054	A-1042	
B	Vert (59MH)	24045A ①				12Y-22A ②			

① Drill new mounting holes.
② Alternate part used in some versions.
③ Use original yoke rear cover and centering device.
④ Use original horiz. yoke damping network.
⑤ Yoke rear cover and centering device.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
8	5	5		5	5	5	5
5	4	4		4	4	4	4
4	N. C. See Note ①	N. C. See Note ①		N. C. See Note ①	N. C. See Note ①	N. C. See Note ①	N. C. See Note ①
(NC) 3	NC	NC		NC	NC	NC	NC
2	1	1		1	1	1	
(NC) 1	NC	NC		NC	NC	NC	NC

① To reduce yoke ringing, install 1000Ω ½ watt resistor in series with capacitor(C95) across terms #2 and #1 of horiz. yoke.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE		Packard-Bell Part No.	REPLACEMENT DATA Halldorson Part No.	Merit Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.	NOTES
	PRI.	SEC.							
T6	4700Ω	3-4Ω	89436A ①	Z1107	A-2030	A-3850	24851	S-3X	① All part #89436 used in model 24DK2.

SPEAKER

ITEM No	TYPE					REPLACEMENT DATA Packard-Bell Part No.	QUAM Part No.	NOTES
	SIZE	FIELD	V. C. IMP					
SP1	6" X 9"	PM	8-8Ω			83113 ①	69AIZ6	① Used in models 21DC3, 21DC4, 24DC2, 24DD2.
SP2	6" X 9"	PM	8-8Ω			83113 ②	69AIZ6	② Not used in some versions.
	6" X 9"	PM	3-4Ω			83118A ③		③ Used in model 21DT2.
	6" X 9"	PM	3-4Ω			83113 ④		④ Used in model 24DT2.
	4"	PM	3-4Ω			83109 ⑤		⑤ Used in model 24DK2.
	4"	PM	3-4Ω			83109 ⑤		
	10"	PM	3-4Ω			83709 ⑤		

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		Packard-Bell PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	1st Video IF	29584		TV-131	6225	
L2	47.25MC Trap	29564A			6226	
L3	39.75MC Trap	29565A			6225	
L4	2nd Video IF	29585	17-4523	TV-130	6219	
L5	3rd Video IF	29587	17-4522	TV-130	6219	
L6	4th Video IF	29644A	17-4522	TV-130	6219	
L7	47.25MC Trap	29564A			6226	
L8	5th Video IF	29587	17-4522	TV-130	6219	
L9	Series Peaking Coil	29566	19-2864		4612	11 Microhenries
L10	Series Peaking Coil	29552	19-3093	TV-181▲	6177▲	90 Microhenries; Wound on 3900Ω resistor.
L11	Shunt Peaking Coil	29509	19-3250	TV-185	6181	250 Microhenries
L12	4.5MC Trap	29548A	20-1005	TV-151	1470	
L13	Series Peaking Coil	29506			6152♦	20 Microhenries; Wound on 22K resistor.
L14	Shunt Peaking Coil	29508	19-3180*	TV-183	6179	180 Microhenries; Wound on 39K resistor.
L15	1st Sound IF	29053B	20-1004	TV-151	1469	
L16	2nd Sound IF	29080				Note 1
L17	Quadrature Coil	29081			1480	

Note 1: Alternate part #29080C used in some versions.
♦ Parallel with 22K resistor.
▲ Parallel with 3900Ω resistor.
* Parallel with 39K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Packard-Bell PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L18	63Ω		29589A	19-1576	TV-163	6210			HS-5	21-40Millihenries

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L19	.250A	37.5Ω	1 HY	27006B	C5037 ①	C-2996 ①	C-2326①	26C44 ①	C-23X ①

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Packard-Bell PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	1½" #26 wire							
M2	3AG S/B P/T	½A 125V	45033		315.500 (3AG-½A-S/B)		MDV ½	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		
		Packard-Bell PART No.	SYLVANIA PART No.	NOTES
M3			1N64	Fine Tuning (Pigtail). Not used in some versions.

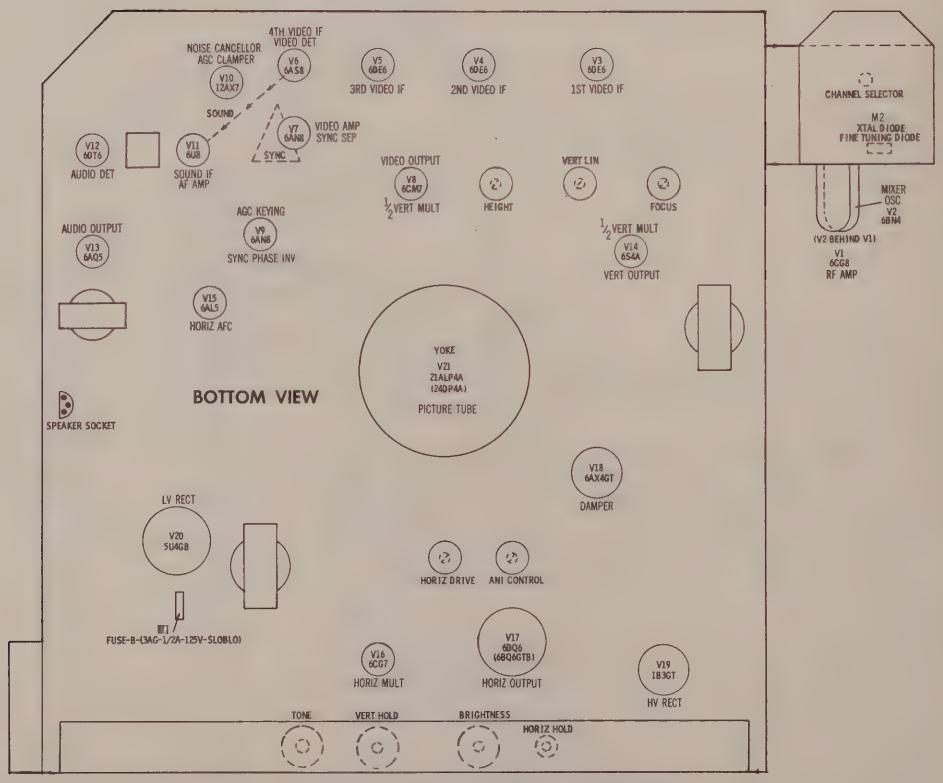
MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M4	Dial Lamp	54008	Type #47.
M5	Tuner	10558C	VHF, Used in 21" VHF Models.
	Tuner	10566A	VHF, Used in 21" VHF Models.
	Tuner	10563A	VHF, Used in 24" VHF Models.
	Tuner	10567B	VHF, Used in 24" VHF Models.
	Tuner	10559B	UHF-VHF, Used in 21" UHF-VHF Models.
	Tuner	10564B	UHF-VHF, Used in 24" UHF-VHF Models.
M6	Switch	86056B	Channel Selector, Wafer Type, Not used in UHF Models.
M7	Switch	86712	Local-Remote, Wafer Type, Not used in UHF Models.
M8	Centering Device	34045A	Part of Yoke Rear Cover.
M9	Ion Trap	28163	
M10	Motor	58063	Remote Drive, 24 Volt, Not used in UHF Models.
M11	Relay	72018A	SPST, 24 Volt, Not used in UHF Models.
	Relay	72022	SPST, 24 Volt, Used in Model 24DK2.
	Safety Glass	55077B	21" Models.
	Safety Glass	55079	24" Models.
	Mask	55078E	21" Models.
	Mask	55080A	24" Models.
	Knob	52181	Local-Remote, Not used in UHF Models.
	Knob	52179	Vert. Hold, Tone.
	Knob	52180C	Horiz. Hold.
	Knob	52174C	Contrast
	Knob	52172	VHF Channel Selector, VHF Models.
	Knob	52173	On-Off-Volume, VHF Models.
	Knob	52179	Brightness, VHF Models.
	Knob	52174C	Fine Tuning, VHF Models.
	Knob	52175	Fine Tuning, UHF Models.
	Knob	52176	VHF Channel Selector, UHF Models.
	Knob	52177A	UHF Channel Selector, UHF Models.
	Knob	52178	On-Off-Volume, UHF Models.
	Knob	52174C	Brightness, UHF Models.

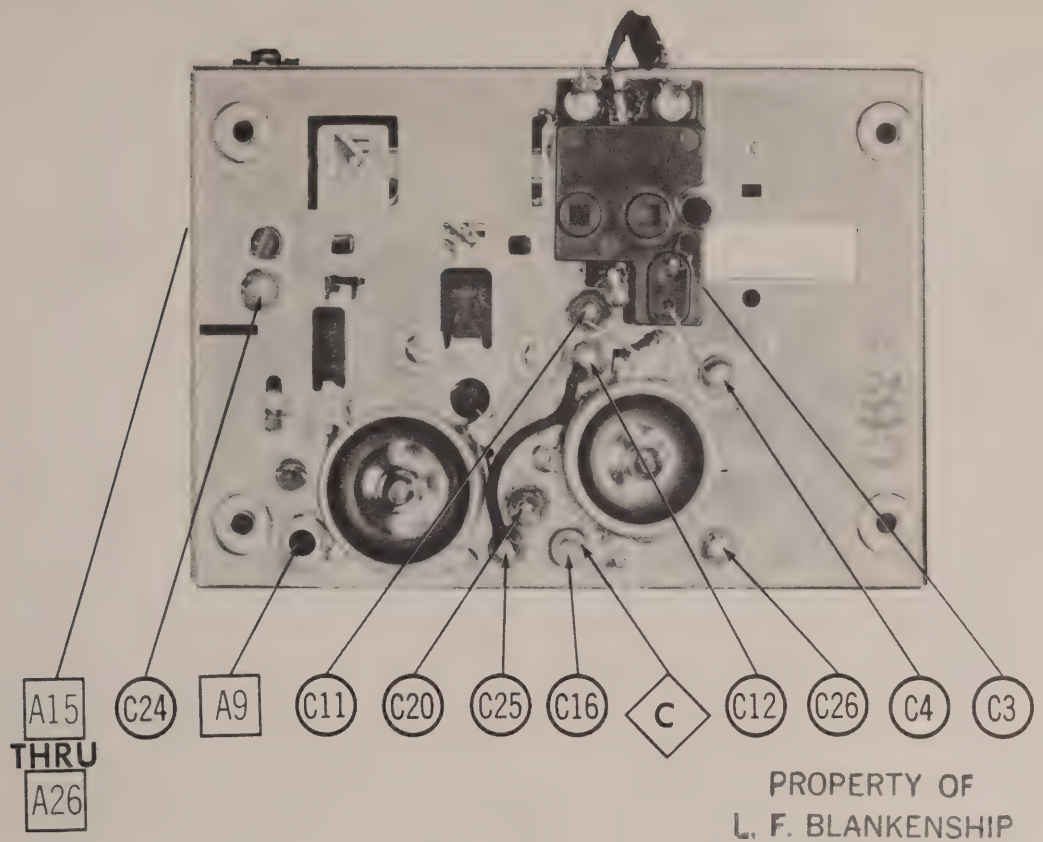
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BN4	0Ω	1.6Meg	0Ω	.1Ω	†2400Ω	0Ω	1.6Meg		
V2	6CG8	10K	†8400Ω	0Ω	0Ω	.1Ω	†2400Ω	†12K	0Ω	224K
V3	6DE6	●40K	68Ω	0Ω	.1Ω	†1600Ω	†1600Ω	0Ω		
V4	6DE6	●33K	120Ω	0Ω	.1Ω	†1500Ω	†1500Ω	0Ω		
V5	6DE6	●33K	68Ω	0Ω	.1Ω	†1400Ω	†1400Ω	0Ω		
V6	6AS8	†2400Ω	.1Ω	180Ω	.1Ω	0Ω	2700Ω	0Ω	.1Ω	†2400Ω
V7	6AN8	†1Meg	6.8Meg	0Ω	0Ω	.1Ω	†4000Ω	†1400Ω	2700Ω	68Ω
V8	6CM7	†3900Ω	NC	0Ω	0Ω	.1Ω	*2.7Meg	●1.6Meg	220K	●3500Ω
V9	6AN8	†8000Ω	†1Meg	2700Ω	0Ω	.1Ω	180K	†38Ω	†70K	†1400Ω
V10	12AX7	100K	●190K	2700Ω	.1Ω	.1Ω	450K	450K	0Ω	0Ω
V11	6U8	†38Ω	100K	†33K	0Ω	.1Ω	†2400Ω	0Ω	50K	500K
V12	6DT6	3.8Ω	560Ω	0Ω	.1Ω	†470K	†7200Ω	560K		
V13	6AQ5	470K	560Ω	.1Ω	0Ω	†400Ω	†38Ω	470K		
V14	6S4A	NC	180Ω	●2.7Meg	.1Ω	0Ω	●2.7Meg	NC	NC	*14K
V15	6AL5	15Ω	15Ω	0Ω	.1Ω	1.6Meg	0Ω	1.6Meg		
V16	6CG7	†6800Ω	2Meg	1500Ω	.1Ω	0Ω	†150K	100K	1500Ω	0Ω
V17	6DQ6	TP	0Ω	NC	10K	700K	NC	.1Ω	0Ω	TOP CAP *10Ω
V18	6AX4GT	TP	NC	300K	NC	†38Ω	TP	0Ω	.1Ω	
V19	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP *325Ω
V20	5U4GB	NC	45K	NC	22Ω	TP	20Ω	NC	45K	
V21	21ALP4A	.1Ω	1Meg	Pin 6 *220Ω	Pin 10 *1Meg	Pin 11 †250K	Pin 12 0Ω			

† MEASURED FROM PIN 2 OF V20.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
* MEASURED FROM PIN 3 OF V18.
NC NO CONNECTION
TP TIE POINT

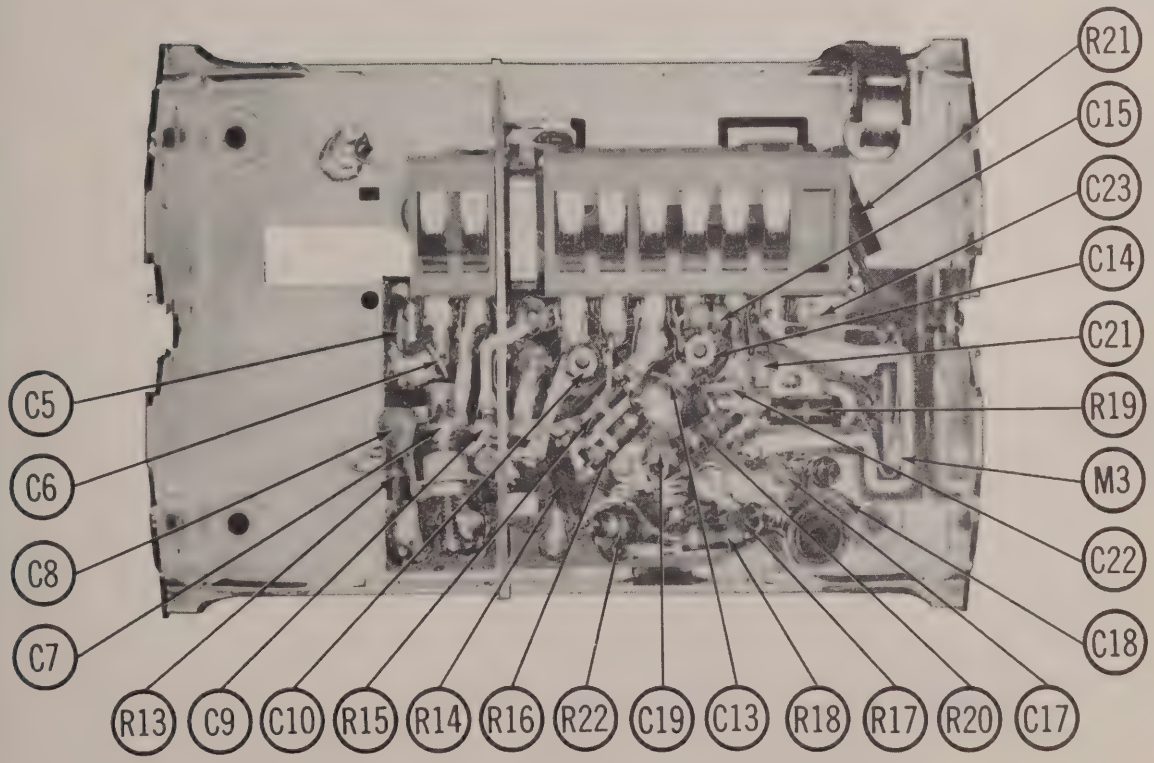


TUBE PLACEMENT CHART

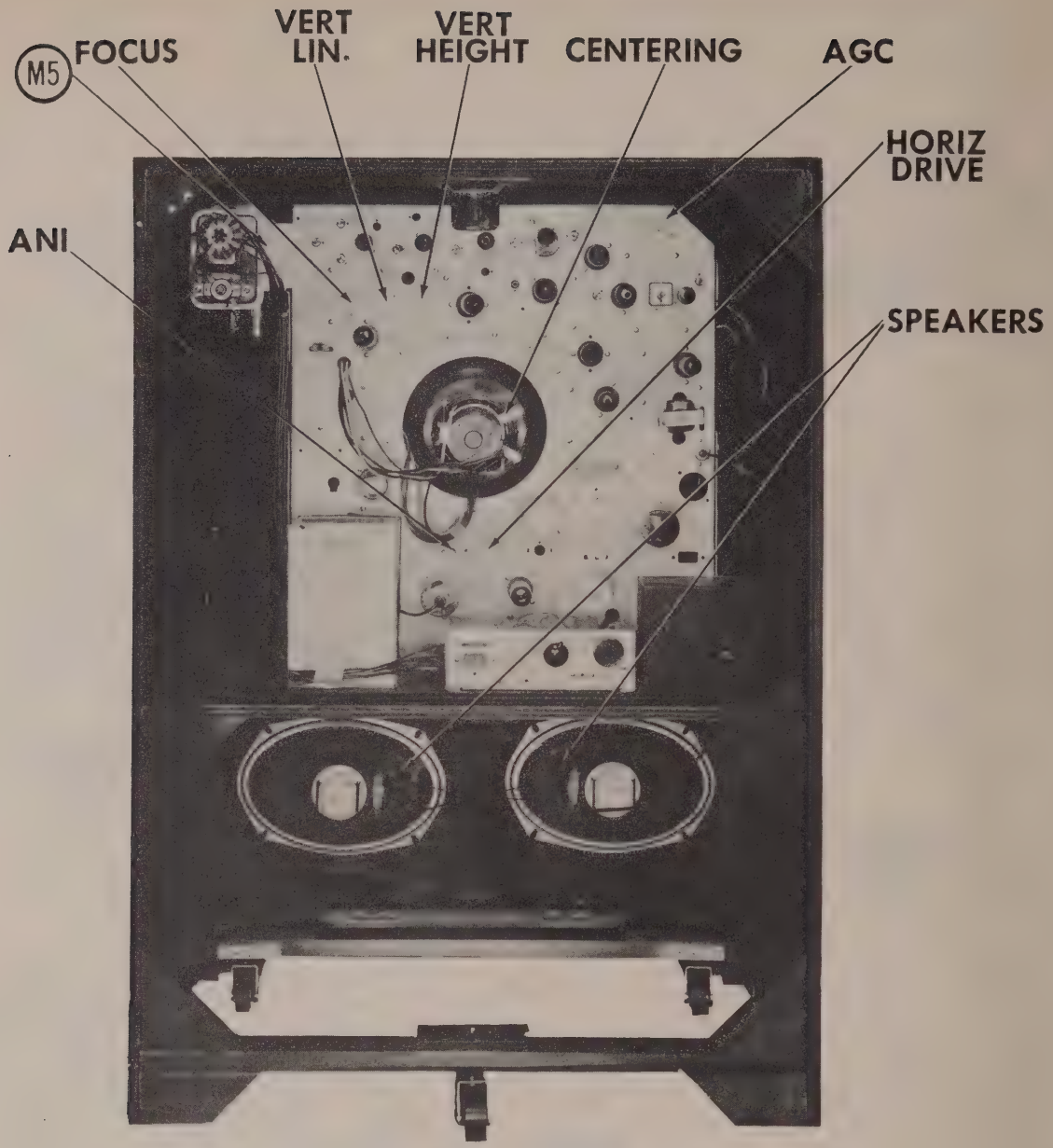


RF TUNER-TOP VIEW

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



RF TUNER-BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.
2. Set the brightness and contrast controls for a normal picture.
3. Turn the horizontal hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.
4. Turn the horizontal hold slowly counter clockwise until the picture just falls into sync.
5. Turn to an unused channel. If vertical lines appear near the center of the screen, slowly adjust the horizontal drive control (R11) until white lines disappear.
6. If in step 5 the horizontal drive was adjusted, tune in a TV station and repeat steps 3 and 4. Check horizontal sync by switching off channel and back again.

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3924 MEADE ST.
DENVER, COLORADO

HARMAN-KARDON
MODEL T-120

HARMAN-KARDON
MODEL T-120

TRADE NAME	Harman-Kardon Model T-120	
MANUFACTURER	Harman-Kardon, Inc., 520 Main St., Westbury, L.I., N.Y.	
TYPE SET	AC Operated FM-AM Tuner	
TUBES (Eight)	Types 12AT7 FM RF Amp.-Mixer, 12AT7 FM Osc.-AFC, 6BE6 AM Conv., 6BA6 1st IF Amp., 6AU6 2nd FM IF Amp.-AM Det-AVC, 6AU6 Limiter, 6AL5 Disc., 12AU7A AF Amp.-Cath. Follower	
POWER SUPPLY	105-125 Volts AC - 60 Cycles	RATING .35 Amp. @ 117 Volts AC (30 Watts)
TUNING RANGE -BROADCAST	530KC - 1650KC	FREQ. MOD. 88MC - 108MC

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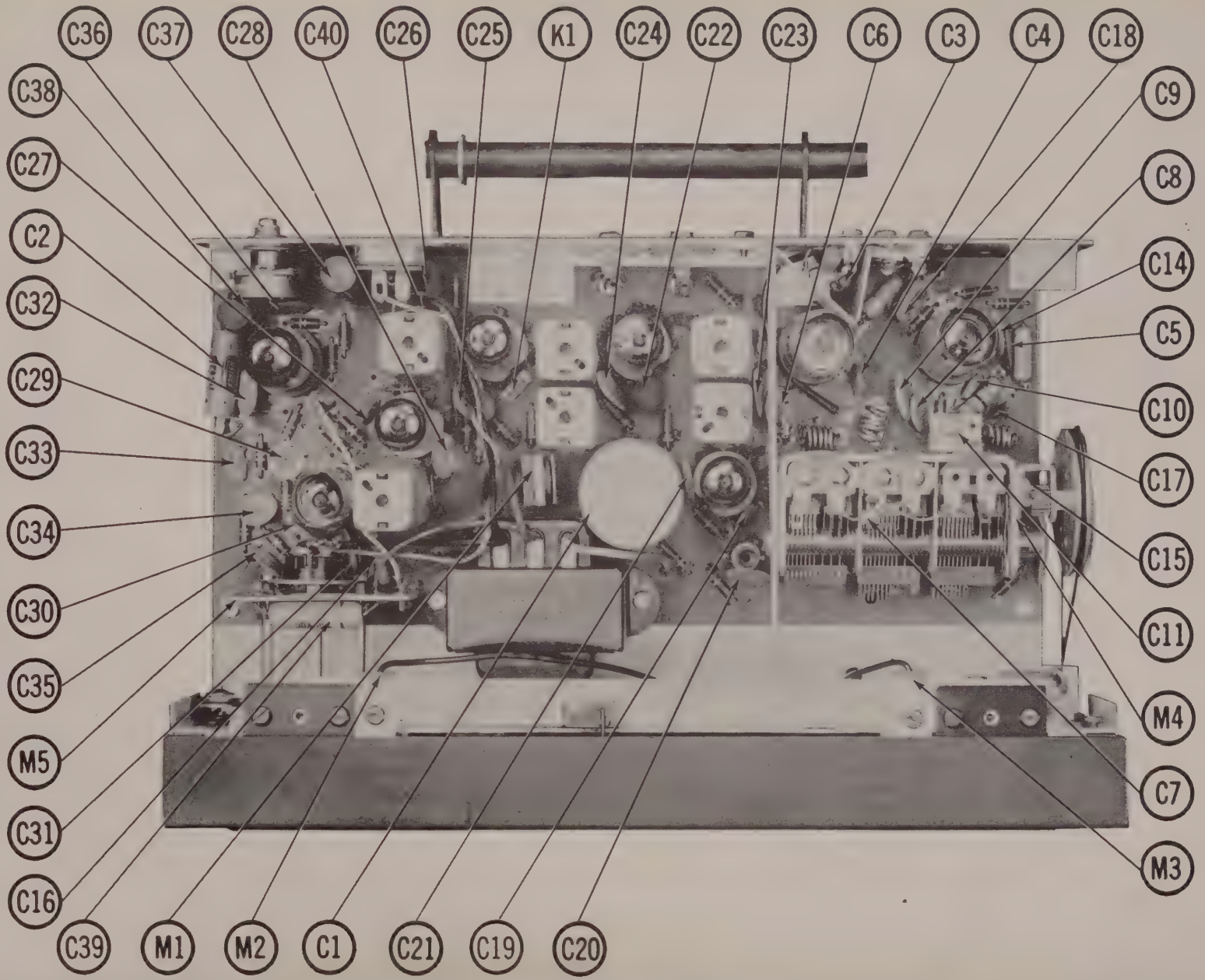
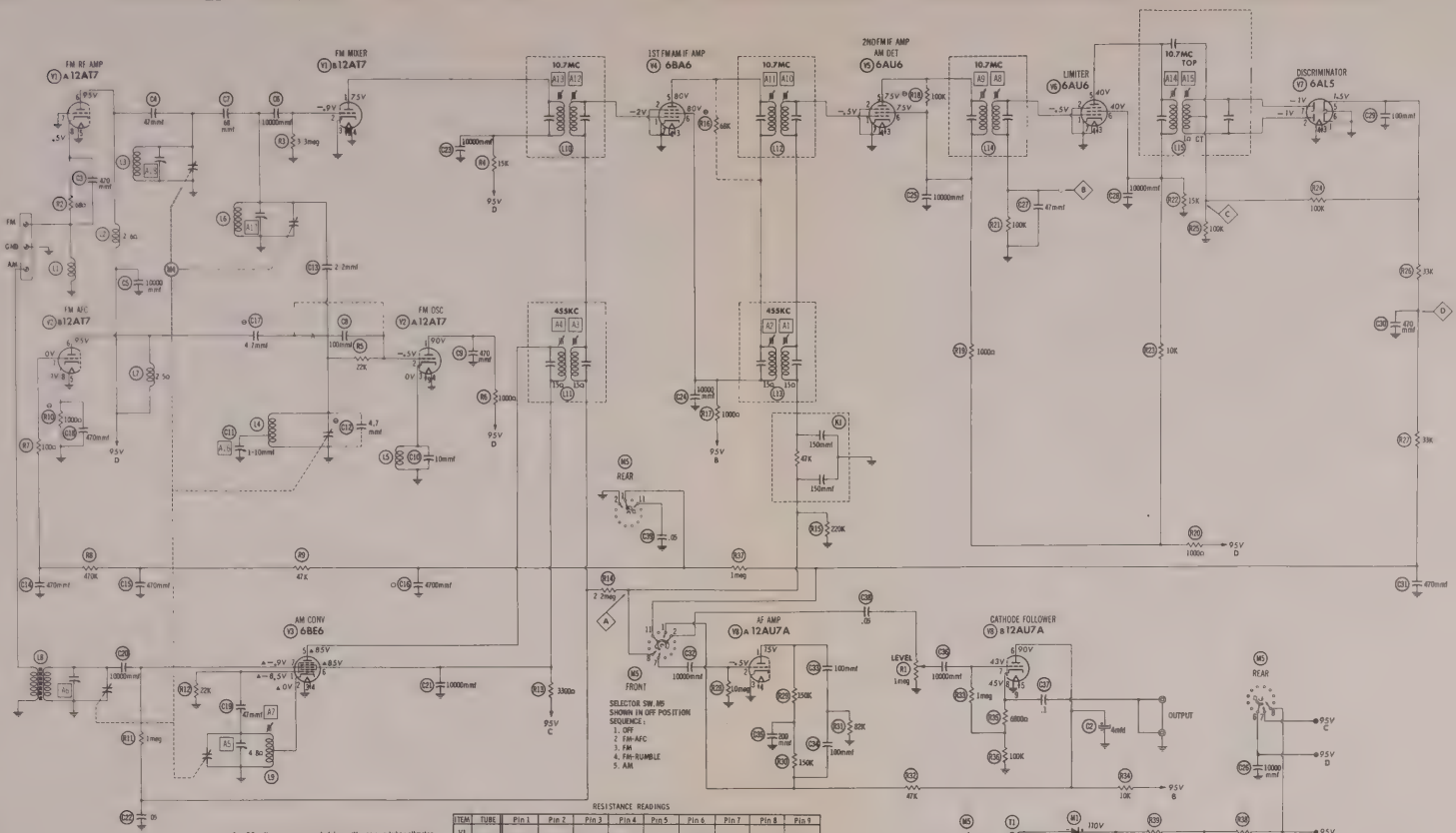


CHASSIS-TOP VIEW -CAPACITOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AT7	†15K	3.3Meg	0Ω	0Ω	0Ω	†660Ω	0Ω	68Ω	3Ω
V2	12AT7	†1660Ω	22K	6Ω	0Ω	0Ω	†660Ω	540K	1000Ω	3Ω
V3	6BE6	∞ 22K	∞ 6Ω	0Ω	3Ω	∗1 400Ω	∗1 400Ω	∞ 3.4Meg		
V4	6BA6	2.4Meg	0Ω	3Ω	0Ω	†1600Ω	†1600Ω	0Ω		
V5	6AU6	270K	0Ω	3Ω	0Ω	†2600Ω	†2600Ω	0Ω		
V6	6AU6	100K	0Ω	3Ω	0Ω	†10K	†10K	0Ω		
V7	6AL5	0Ω	100K	3Ω	0Ω	200K	0Ω	100K		
V8	12AU7A	†350K	10Meg	0Ω	3Ω	3Ω	†10K	1.1Meg	100K	0Ω

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE NOTED.
† MEASURED FROM OUTPUT OF M1.
▲ MEASURED IN "AM" POSITION.

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

◆ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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354-9

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CHASSIS-TOP VIEW-RESISTOR IDENTIFICATION

HARMAN-KARDON
MODEL T-120

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to AM RF stator lug on tuning gang. Low side to chassis.	455KC (400∿ Mod)	AM	1600KC	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	Direct	High side to AM antenna terminal. Low side to chassis.	1500KC	"	1500KC	"	A5, A6	"
3.	"	"	600KC	"	600KC	"	A7	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to FM RF stator lug on tuning gang. Low side to chassis.	10.7MC (unmod)	FM	Point of non-interference.	DC probe to point Ⓑ. Common to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A14	"
6.	"	"	"	"	"	DC probe to point Ⓓ. Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to FM RF stator lug on tuning gang. Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference.	Vert. amp. to point Ⓑ. Low side to chassis.	A8, A9, A10, A11, A12, A13	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5.	"	"	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A14	"
6.	"	"	"	"	"	Vert. amp. to point Ⓓ. Low side to chassis.	A15	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	270Ω carbon resistor	High side thru 270Ω to FM antenna terminals. Low side to chassis.	106MC	FM	106MC	DC probe to point Ⓑ. Common to chassis.	A16, A17, A18	Adjust for maximum deflection.
8.	"	"	90MC	"	90MC	"	L3, L4, L5	Adjust for maximum deflection by compressing or expanding coil turns.

FIG. 1

FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amp. -FM Mixer	12AT7	
V2	FM Osc. -FM AFC	12AT7	
V3	AM Converter	6BE6	
V4	1st IF Amplifier	6BA6	
V5	2nd FM IF Amp. -AM Det. -AVC	6AU6	
V6	Limiter	6AU6	
V7	Discriminator	6AL5	
V8	AF Amp. -Cath. Follower	12AU7A	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Harman-Kardon PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■40	150	JE781436C						
B	▲60	150							
C	60	150							
C2	4	150		PRS150V4	BBR4-150	TC40	TD-4-150	FM-1504	TVA-1402

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

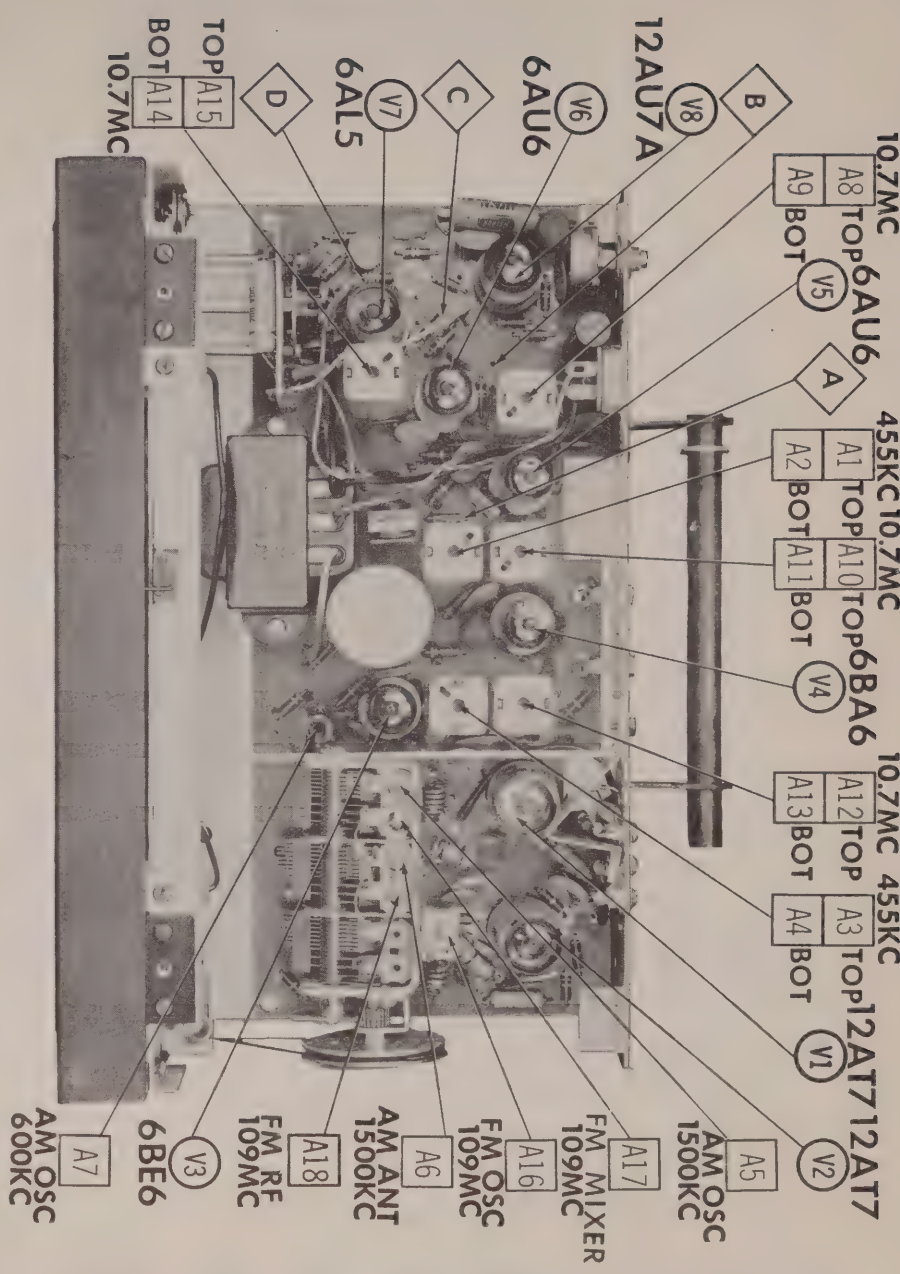
ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Harman-Kardon PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	470			BPD-00047	DD-471	LT6T47	ED-470	UC-5347	5GA-T47	
C4	47			N750-SI 47	TCN-47	C10Q47U	TC7-47	NT-5447	5TCU-Q47	
C5	10000			BPD-01	DD-103	BYA6SI	ED-01	DC511	5HK-SI	
C6	10000			BPD-01	DD-103	BYA6SI	ED-01	DC511	5HK-SI	
C7	. 68				TCZ-R68					
C8	100			N750-SI 100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	
C9	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C10	10			N750-SI 10	TCN-10	C10Q1U	TC7-10	NT-541	5TCU-Q1	
C11	1-10		JV20688							
C12	4. 7			NP0-SI 4. 7	TCZ-4R7	C10V47C	TCO-4. 7	ZT-5547	5TCCB-V47	Note 3
C13	2. 2			NP0-SI 2. 2	TCZ-2R2	C10V22C	TCO-2. 2		5TCCB-V22	
C14	470			BPD-00047	DD-471	BYA6T47	ED-470	UC-5347	5GA-T47	
C15	470			BPD-00047	DD-471	BYA6T47	ED-470	UC-5347	5GA-T47	
C16	4700			BPD-0047	D6-472	LT6D47	GP-4700	UC-5247	5HK-D47	Note 2
C17	4. 7			NP0-SI 4. 7	TCZ-4R7	C10V47C	TCO-4. 7	ZT-5547	5TCCB-V47	Note 1
C18	470			BPD-00047	DD-471	BYA6T47	ED-470	UC-5347	5GA-T47	
C19	47			N750-SI 47	TCN-47	C10Q47U	TC7-47	NT-5447	5TCU-Q47	
C20	10000			BPD-01	DD-103	BYA6SI	ED-01	DC511	5HK-SI	
C21	10000			BPD-01	DD-103	BYA6SI	ED-01	DC511	5HK-SI	
C22	. 05	200		BPD-05	DF-503	BC2S47J		ACE615	2SE-S47	
C23	10000			BPD-01	DD-103	BYA6SI	ED-01	DC511	5HK-SI	
C24	10000			BPD-01	DD-103	BYA6SI	ED-01	DC511	5HK-SI	
C25	10000			BPD-01	DD-103	BYA6SI	ED-01	DC511	5HK-SI	
C26	10000			BPD-01	DD-103	BYA6SI	ED-01	DC511	5HK-SI	
C27	47			N750-SI 47	TCN-47	C10Q47U	TC7-47	NT-5447	5TCU-Q47	
C28	10000			BPD-01	DD-103	BYA6SI	ED-01	DC511	5HK-SI	
C29	100			N750-SI 100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	
C30	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C31	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C32	10000			BPD-01	DD-103	BYA6SI	ED-01	DC511	5HK-SI	
C33	100			N750-SI 100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	
C34	100			N750-SI 100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	
C35	200				TCZ-200		TCO-200			
C36	10000			BPD-01	DD-103	BYA6SI	ED-01	DC511	5HK-SI	
C37	.1	200			DF-104	BC2P1J		ACE601	2SE-P1	
C38	. 05	200		BPD-05	DF-503	BC2S47J		ACE615	2SE-S47	
C39	. 05	200		BPD-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C40	10000			BPD-01	DD-103	BYA6SI	ED-01	DC511	5HK-SI	

Note 1: Some versions use 10MMF in this application.
Note 2: Some versions use 10000MMF in this application.
Note 3: Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Harman-Kardon PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1Meg	½	RV811600					Output Level

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Harman-Kardon PART No.	IRC PART No.	
R2	68Ω			BTS-68	
R3	3.3Meg			BTS-3.3Meg	
R4	15K			BTS-15K	
R5	22K			BTS-22K	Note 3
R6	1000Ω			BTS-1000	
R7	100Ω			BTS-100	
R8	470K			BTS-470K	
R9	47K			BTS-47K	
R10	1000Ω			BTS-1000	Note 1
R11	1Meg			BTS-1Meg	
R12	22K			BTS-22K	
R13	3300Ω			BTS-3300	
R14	2.2Meg			BTS-2.2Meg	
R15	220K			BTS-220K	
R16	68K			BTS-68K	Note 2
R17	1000Ω			BTS-1000	
R18	100K			BTS-100K	Note 2
R19	1000Ω			BTS-1000	
R20	1000Ω			BTS-1000	
R21	100K			BTS-100K	
R22	15K			BTS-15K	
R23	10K			BTS-10K	
R24	100K			BTS-100K	
R25	100K			BTS-100K	
R26	33K			BTS-33K	
R27	33K			BTS-33K	
R28	10Meg			BTS-10Meg	
R29	150K			BTS-150K	
R30	150K			BTS-150K	
R31	82K			BTS-82K	
R32	47K			BTS-47K	
R33	1Meg			BTS-1Meg	
R34	10K			BTS-10K	
R35	6800Ω			BTS-6800	
R36	100K			BTS-100K	
R37	1Meg			BTS-1Meg	
R38	330Ω			BTS-330	
R39	330Ω			BTS-330	

Note 1: 560Ω used in some versions.
Note 2: Not used in some versions.
Note 3: 10K used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .35A	120VAC @ .037A Tap @ 6.3VAC @ 2.45A			FT7814190					

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		Harman-Kardon PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil					.24 Microhenries; IRC part #CLA
L2	FM RF Choke					3.3 Microhenries; IRC part #CLA
L3	FM RF Coil	GL781543				
L4	FM Osc. Coil	GL781544				
L5	Cathode Choke		19-1000		4602	1 Microhenry; IRC part#CLA
L6	FM Mixer Coil	GL781543				
L7	RF Choke		19-1000		4602	1 Microhenry; IRC part #CLA - Note 1
L8	Loop Stick	GL781479A				
L9	AM Osc. Coil					
L10	1st FM IF	GL78149IA	16-3490			
L11	1st AM IF	GT781493A	16-6780		13-PC1	
L12	2nd FM IF	GT781570	16-3490			
L13	2nd AM IF	GT781493A	16-6780		13-PC2	
L14	FM Limiter	GT781570	16-3490			
L15	FM Discriminator	GT781492A	17-3491			

Note 1: Some versions may use 3.3 Microhenries.

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

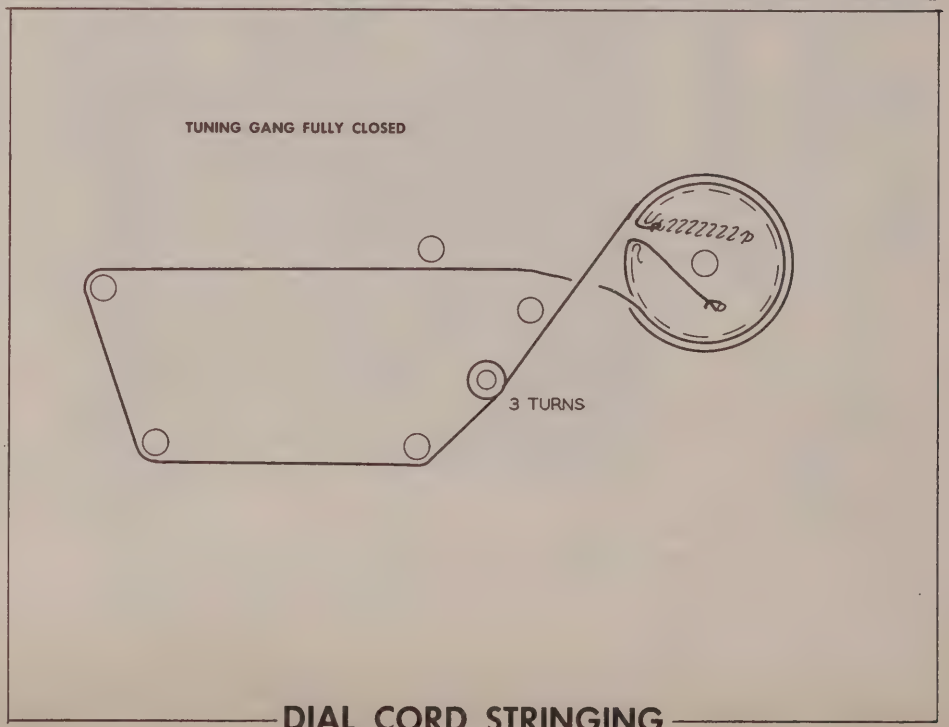
ITEM No.	USE	DESCRIPTION	Harman-Kardon PART No.	REPLACEMENT DATA	
K1	AM Det. RF Filter	150MMF, 150MMF, 47K		Aerovox	PA-98
				Centralab	PC-51
				Cornell-Dubilier	111TM2
				Erie	1403-02
				Sprague	D-2

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Harman-Kardon PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.037A	Z781490		RS065Q		8J1B	50	

MISCELLANEOUS

ITEM No.	PART NAME	Harman-Kardon PART No.	NOTES
M2	Dial Light		#51
M3	Dial Light		#51
M4	Tuning Cap.	C811553A	6 Gang, Alternate part #JV811553.
M5	Switch	ER811545B	Function
	Glass	P811551A	Dial Ass'y.
	Pointer	Z811552A	
	Knob	P25790	Function, Tuning
	Cabinet	P811557A	Metal



DIAL CORD STRINGING

KNIGHT
MODEL 93SZ695

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

KNIGHT
MODEL 93SZ695

KNIGHT
MODEL 93SZ695

TRADE NAME	Knight Model 93SZ695
SUPPLIER	Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill.
TYPE SET	AC Operated 5 Channel 80 Watt Audio Amplifier
TUBES (Ten)	Types 6SC7 Mic-Phono Preamp, 6SC7 Mixer, 6SL7 AF Amp. -Phase Inv., 6SN7GT Driver, (2) 807 Output, (2) 5Y3GT Rectifier, (2) 5U4G Rectifier
POWER SUPPLY	110-130 Volts AC - 60 Cycles RATING 1.2 Amp. @ 117 Volts AC (125 Watts)

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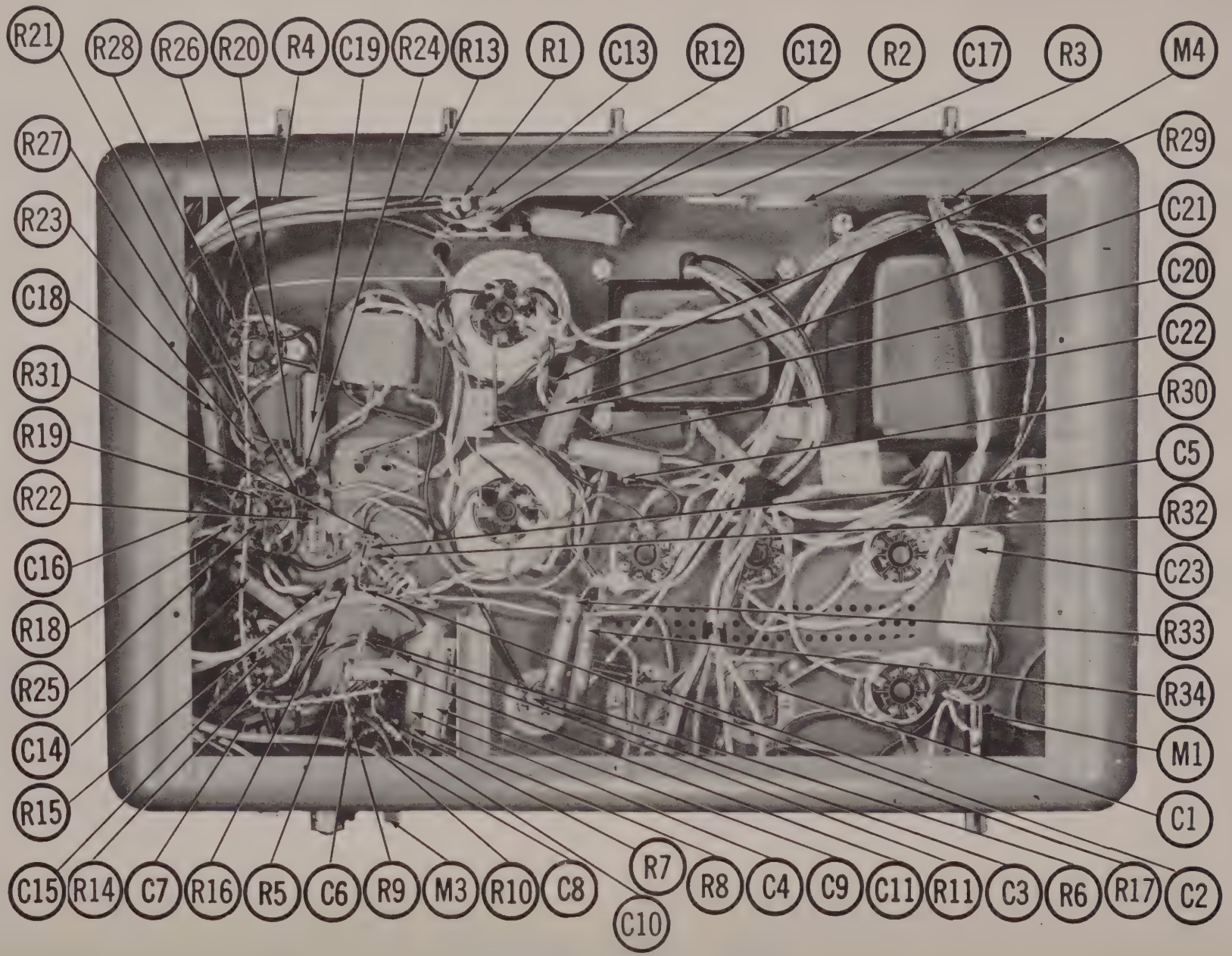


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Mic 1 Preamplifier - Mic 2-Mag. Phono Preamp.	6SC7	
V2	Mixer	6SC7	
V3	AF Amp. -Phase Inv.	6SL7GT	
V4	Driver	6SN7GT	
V5	Output	807	

ITEM No.	USE	TYPE	NOTES
V6	Output	807	
V7	Rectifier	5Y3GT	
V8	Rectifier	5Y3GT	
V9	Rectifier	5U4G	
V10	Rectifier	5U4G	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	KNIGHT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	125	350		AFHS1-43	XA0411	FP140	TMS-48	S-230	TVL-1638
C2	125	350							
C3	250	50		PRS50V250	BRH5025	FP117 TC3501	TMS-14	S-055 MT-05100	TVL-1324
C4	8	450		PRS450V8	BR845	TC71	TD-8-450	FM-4508	TVA-1704
C5A	10	450		AFH3-31	CO240	FP375. 8	TMT-32	T-125	TVL-3776
B	▲10	450							
C	■10	450							

FIXED CAPACITORS

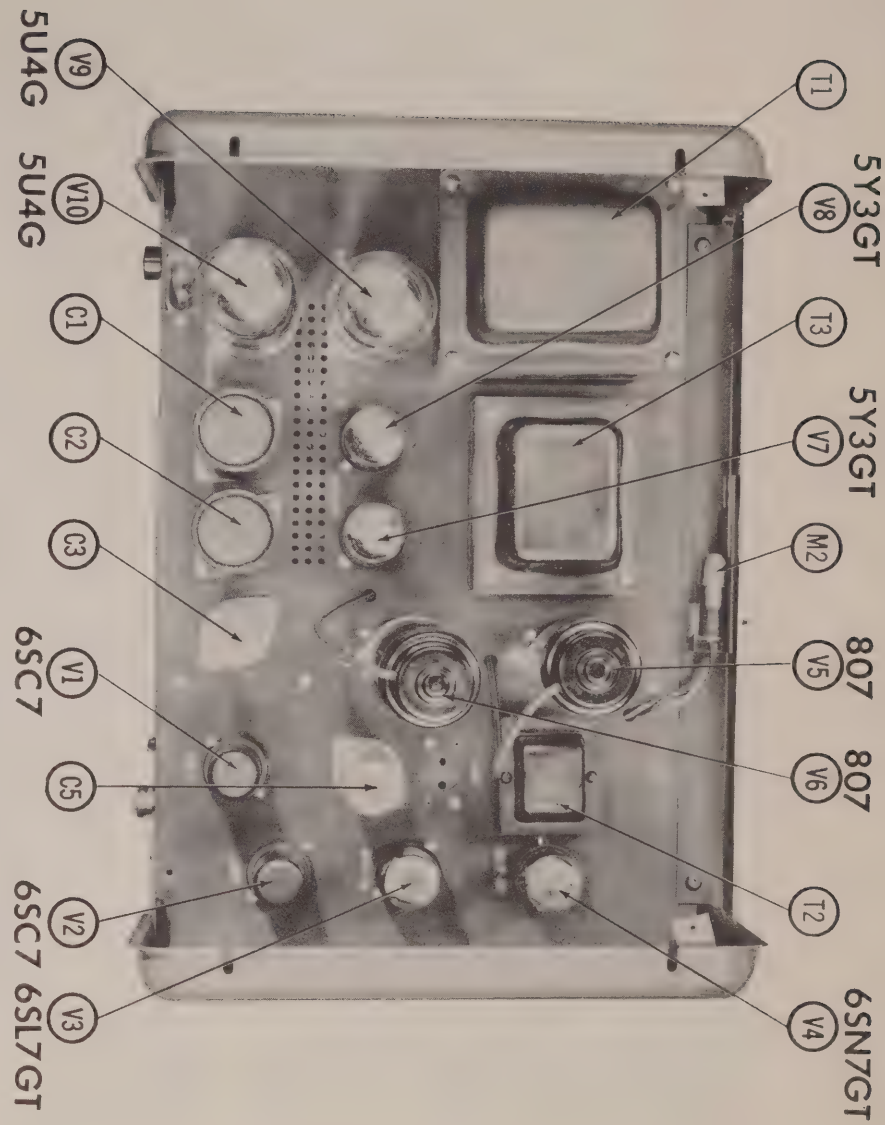
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	KNIGHT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	.022	200		BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C7	.047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C8	.022	200		BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C9	.047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C10	4700			BPD-0047	DD-472	K079	ED-0047	UC-5247	5HK-D47	
C11	.01	600		BPD-01	DD-103	CUB6S1	ED-01	GEM-611	6TM-S1	
C12	.047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C13	.047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C14	.1	600		P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C15	.01	200		BPD-01	DD-103	CUB4S1	ED-01	GEM-411	4TM-S1	
C16	.0022	600		BPD-0022	D6-222	CUB6D22	ED-0022	GEM-6222	6TM-D22	
C17	4700			BPD-0047	DD-472	K079	ED-0047	UC-5247	5HK-D47	
C18	.047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C19	.047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C20	470			1468-00047	D6-471	5W5T47	ED-470	UC-5347	IFM-347	
C21	.01	1600		P1688N-01		CUB16S1		GEM-1611	MB-S1	
C22	.01	1600		P1688N-01		CUB16S1		GEM-1611	MB-S1	
C23	.05	600		BPD-05	DF-503	CUB6S5		GEM-615	6TM-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	KNIGHT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½		AB-59	A47-500K-S	Q11-113	U50	MIC 2 - Mag. Phono
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	
R2A	1Meg							Phono 1 & 2, Tap @ 500K
B	Shaft							
R3A	500K	½						Treble
B	2. 5Meg	½						Bass
R4A	500K	½		AB-60	A47-500K-Z	Q13-133	U48	MIC 1
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	KNIGHT PART No.	IRC PART No.	
R5	3.3Meg			BTS-3.3Meg	
R6	470K			BTS-470K	
R7	47K			BTS-47K	
R8	22K			BTS-22K	
R9	3.3Meg			BTS-3.3Meg	
R10	220K			BTS-220K	
R11	68K			BTS-68K	
R12	470K			BTS-470K	
R13	470K			BTS-470K	
R14	1000Ω			BTS-1000	
R15	68K	1		BTA-68K	
R16	33K			BTS-33K	
R17	10K			BTS-10K	
R18	470K			BTS-470K	
R19	330K			BTS-330K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	KNIGHT PART No.	IRC PART No.	
R20	4700Ω			BTS-4700	
R21	15Ω			BTS-15	
R22	560Ω			BTS-560	
R23	4700Ω			BTS-4700	Note 1
R24	330K			BTS-330K	
R25	4700Ω			BTS-4700	
R26	470K			BTS-470K	
R27	470K			BTS-470K	
R28	680Ω			BTS-680	
R29	47Ω	2			
R30	47Ω	2			
R31	10K			BTS-10K	
R32	470Ω	2		BTB-470	
R33	1000Ω	10		PW10-1000	
R34	500Ω	10		PW10-500	

Note 1: 27K used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	KNIGHT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	130VAC Tap ⓐ 117VAC ⓐ 1.2A	880VCT ⓐ .024A Tap ⓐ 530VCT ⓐ .028A	160VCT ⓐ .040A	5VAC ⓐ 6A	LP-0212-B					
		SEC. 4	SEC. 5	SEC. 6						
		5VAC ⓐ 2A	5VAC ⓐ 2A	6.3VCT ⓐ 3.65A						

TRANSFORMER (INPUT)

ITEM No.	Turns Ratio		REPLACEMENT DATA						NOTES
	PRI. 1	SEC.	KNIGHT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	.4 : 1		LD-0015						
	PRI. 2								
	2.5 : 1								

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

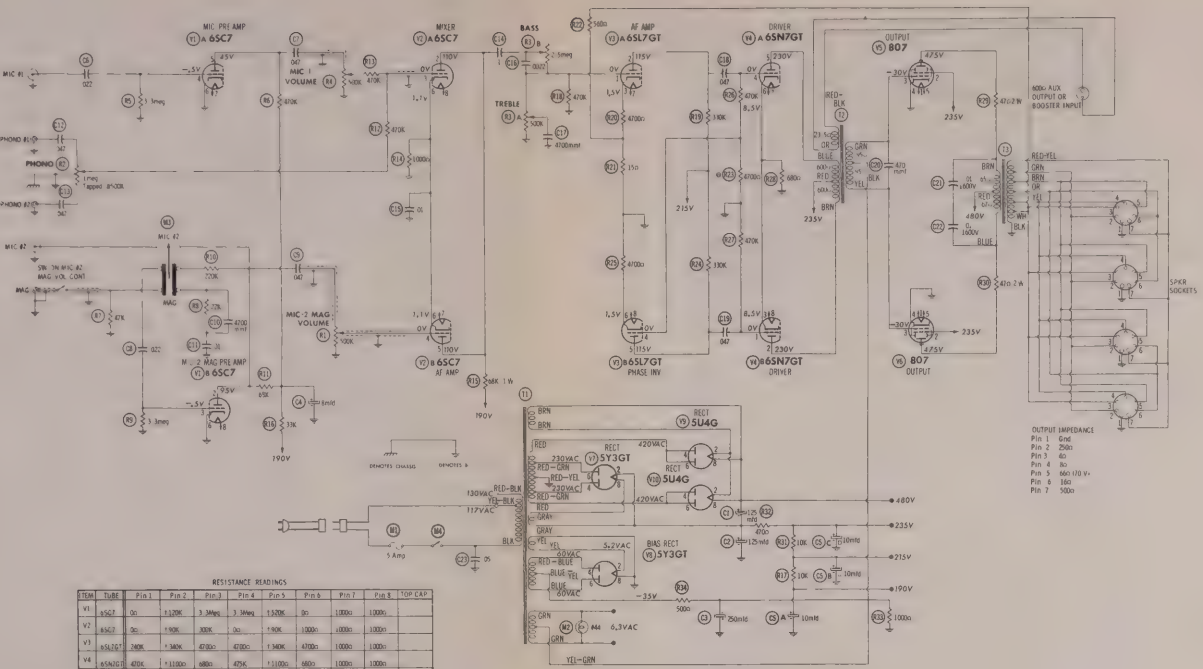
ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	KNIGHT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T3	3500Ω CT	500Ω Tap ⓐ 250Ω, 66Ω (70V), 16Ω, 8Ω, 4Ω	LO-0119-D						

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			KNIGHT PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG S/B	5A 125V			313005. (3AG-S/B-5A)	341001	MDX 5	HKP

MISCELLANEOUS

ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M2	Pilot Light		#44
M3	Switch		Mag.-Mic 2, Slide Type (DPDT)
M4	Switch		Power On-Off



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	TOP CAP
V1	6SC7	0Ω	†270K	3.3Meg	3.3Meg	†270K	0Ω	1000Ω	1000Ω	
V2	6SC7	0Ω	†90K	300K	0Ω	†90K	1000Ω	1000Ω	1000Ω	
V3	6SL7GT	240K	†340K	470Ω	470Ω	†340K	470Ω	1000Ω	1000Ω	
V4	6SN7GT	470K	†1100Ω	680Ω	475K	†1100Ω	680Ω	1000Ω	1000Ω	
V5	807	1000Ω	†470Ω	1100Ω	0Ω	1000Ω	NC	NC	NC	††1150
V6	807	1000Ω	†470Ω	1100Ω	0Ω	1000Ω	NC	NC	NC	††1200
V7	5Y3GT	NC	30K	NC	20Ω	NC	20Ω	NC	30K	
V8	5Y3GT	NC	5Ω	NC	1500Ω	NC	1500Ω	NC	0Ω	
V9	5U4G	NC	50K	NC	32Ω	NC	32Ω	NC	50K	
V10	5U4G	NC	50K	NC	30Ω	NC	30Ω	NC	50K	

†† MEASURED FROM PIN 8 OF V10.
† MEASURED FROM PIN 2 OF V7.
NC NO CONNECTION

@ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1 DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2 Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5 Nominal tolerance of component values makes possible a variation of ±10% in voltage and resistance readings
6. All controls at minimum, proper output load connected

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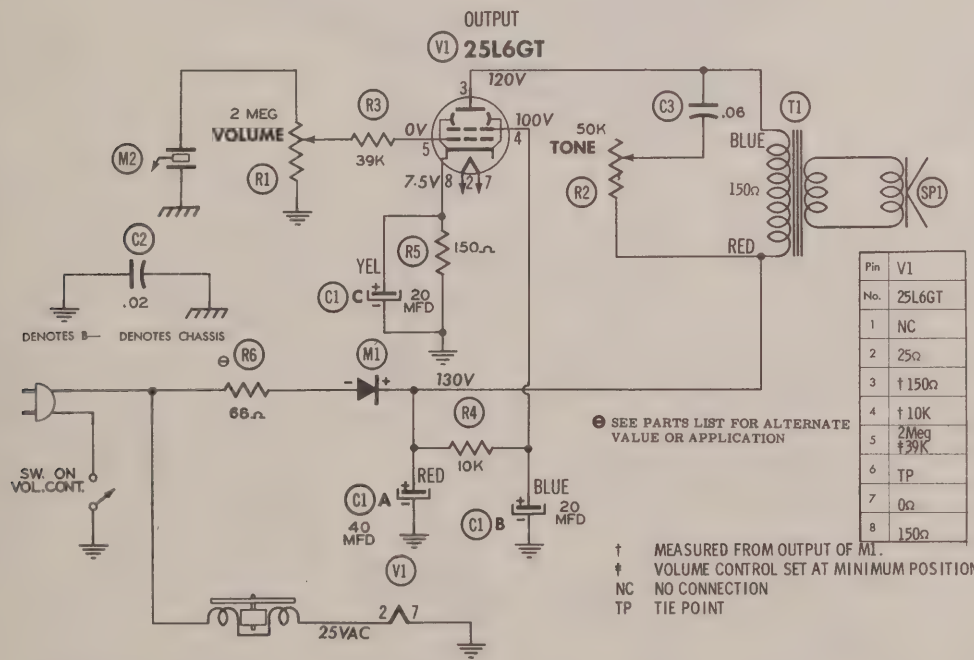
3924 MEADE ST.
DENVER, COLORADO

PHONOLA
MODELS 155, 255, 355, 455, 555

PHONOLA
MODELS 155, 255, 355, 455, 555

TRADE NAME	Phonola Models 155, 255, 355, 455, 555
MANUFACTURER	Waters Conley Co., Inc., Rochester, Minn.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Manual Record Player (Models 155, 355, 455, 555)
TUBES (One)	Type 25L6GT Output
POWER SUPPLY	105-125 Volts AC - 60 Cycles RATING .34 Amp. @ 117 Volts AC

A 45RPM AUTOMATIC RECORD CHANGER IS USED IN MODEL 255. FOR SERVICE INFORMATION ON THIS UNIT - SEE SIMILAR RCA MODEL RP-190 SERIES - PHOTOFACT SET #144 - FOLDER #7 OR RECORD CHANGER MANUAL CM-4.



Pin No.	V1 25L6GT
1	NC
2	25Ω
3	† 150Ω
4	† 10K
5	2Meg ‡39K
6	TP
7	0Ω
8	150Ω

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

† MEASURED FROM OUTPUT OF M1.
‡ VOLUME CONTROL SET AT MINIMUM POSITION.
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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354-14

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	25L6GT	

ITEM No.	USE	TYPE	NOTES

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PHONOLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150	11747	PRS150/25V	BBRT4215C		TML-2	FMT-321	TVA-3423
B	20	150		4020/20					
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	PHONOLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.02	200	11508	BPD-02	DD-203	CUB2S2	817-02	PT412	2TM-S2	
C3	.06	200	11509	P288N-06		CUB6S6		PT616	6TM-S6	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PHONOLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2Meg	½	11748	AB-76	A47-2Meg-Z	Q13-139	U-55	Volume
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	
R2A	50K	½	11749	AB-32	A47-50K-Z	Q13-123	U33	Tone
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PHONOLA PART No.	IRC PART No.	
R3	39K		9144	BTS-39K	
R4	10K		9273	BTS-10K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PHONOLA PART No.	IRC PART No.	
R5	150Ω		9897	BTS-150	
R6	68Ω 5%			BTS-68 5%	Note 1

Note 1: Some versions use a 56Ω resistor in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	PHONOLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.3K	3.2Ω	Part of spkr. 11752	Z1101	A-3025	A-3332	26S58 ①	Z1101	① Drill one new mtg. hole.

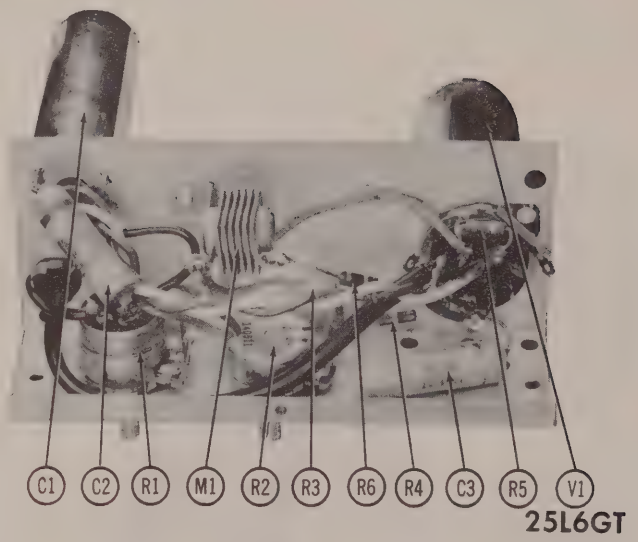
SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PHONOLA PART No.	QUAM PART No.	
SP1	4"	PM	3.2Ω	11752	4A07	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	PHONOLA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.051A	11756	1263A	RS065	6S65	8J1	65	

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	PHONOLA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M2	11767	30	♦N4-2J	51-2 *2400	PFT-1	*Complete arm & cartridge ass'y. ♦ Not supplied with cart. Used in model 155.
	11860	62-1	K	51-1	PFT-1	Used in model 255.
	11894	66-TS *P-66T	K and K-78	*24H60	PT-2	Use in models 355, 455 or 555. *Complete tone arm and cartridge ass'y.
		*P-29				*Complete tone arm and cartridge ass'y. for use with model 155.

ASTATIC NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	PHONOLA PART No.	JENSEN PART No.	WALCO PART No.	
M3	10682 ①	*J-752 or §NY-252 or ♦NY-252D		* Metal † Jewel ♦ Diamond §Nylon
	11861 ②	*A76LP or †A67LP or ♦A67LPD	*W-39MGA or †W-39MGS or ♦W-39MGD	① Used in model 155. ② Used in model 255. ③ Use in models 355, 455, or 555.
	11895 ③ 11896 ③	*A-76 or †A-67 or ♦A-67D and *A76LP or †A67LP or ♦A67LPD	*W-39A or †W-39S or ♦W-39D and *W-39MGA or †W-39MGS or ♦W-39MGD	

PROPERTY OF
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DENVER, COLORADO

RCA VICTOR
MODEL 7-HF-45 (Ch. RS-159)

RCA VICTOR
MODEL 7-HF-45 (Ch. RS-159)

TRADE NAME	RCA Victor Model 7-HF-45 (Ch. RS-159)
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 8, N. J.
TYPE SET	AC Operated Phono Amplifier With 45RPM Record Changer
TUBES (Four)	Types 12AX7 AF Amp. -Phase Inv., (2) 35C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING .3 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE RCA RP-190 SERIES - PHOTOFACT SET 144 - FOLDER 7 OR RECORD CHANGER MANUAL CM-4.

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PARTS LIST AND DESCRIPTIONS

RCA VICTOR
MODEL 7-HF-45 (Ch. RS-159)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. -Phase Inv.	12AX7	
V2	Output	35C5	
V3	Output	35C5	
V4	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	75980	PRS150V4080	BBRD8415	TCD498	TDLD-12	FMT-1540	TVA-3451
B	50	150							
C2	5	50	74521	SRE50V5	BBR5-50	TC30	TD-5-50	MMT-0505	TVA-1303
C3	5	10VAC	100565	PRS10VAC8	BBR10-25 † BBR10-25 †	TC22 † TC22 †		MMT-0210 † MMT-0210 †	R2316*

† Connect negative leads together.
* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	.047	400	73553	BPD-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C5	680		102721	BPD-00068	D6-681	G065	ED-680	UC-5368	5GA-T68	
C6	820		102356	S1 820	D6-821	G067	ED-820		5GA-T82	
C7	.0033	400	73795	BPD-0033	D6-332	CUB6D33	GP-3300	GEM-6233	6TM-D33	
C8	.0082	400	79019							
C9	.033	200	79015	BPD-03	DF-303	CUB6S33		GEM-4133	6TM-S33	
C10	.0022	600	73595	BPD-0022	D6-222	CUB6D22	GP-2200	GEM-6222	6TM-D22	
C11	.1	400	73551	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C12	.01	400	73561	BPD-01	D6-103	CUB411	GP-10000	GEM-411	4TM-S1	
C13	.022	400	73562	BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C14	.047	400	73553	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1.5Meg	½	102681	ABT-167		Q18-139XX	UDT-291	Volume, Tap@ 250K & 500K
B	Shaft			AK-3		Not Req.	Not Req.	
R2	1Meg*	½	102682					Tone & Switch

* Open in center, 500K each side.

RESISTORS

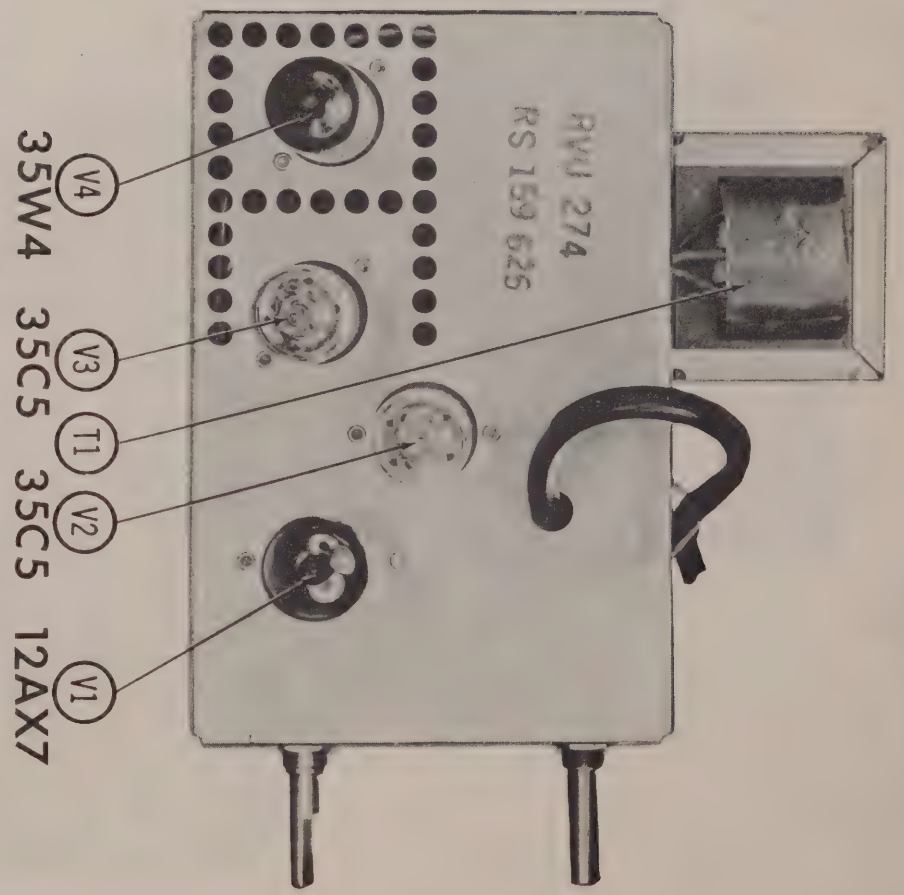
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA RCA Victor PART No.	IRC PART No.	NOTES
R3	47K		502347	BTS-47K	
R4	2.2Meg		502522	BTS-2.2Meg	
R5	56K		502356	BTS-56K	
R6	12K		502312	BTS-12K	
R7	220K		502422	BTS-220K	
R8	8200Ω		502282	BTS-8200	
R9	12K		502312	BTS-12K	
R10	220K		502422	BTS-220K	
R11	470K		502447	BTS-470K	
R12	470K		502447	BTS-470K	
R13	100K		502410	BTS-100K	
R14	82Ω	1	512082	BTA-82	
R15	1000Ω	1	512210	BTA-1000	
R16	33Ω	1	512033	BTA-33	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	4000Ω CT	3-4Ω	100466	Z1002	A-2901	A-3823	24S61	S-53X	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	RCA Victor PART No.	QUAM PART No.	
SP1	6½"	PM	3-4Ω	100464	6A21	
SP2	3½"	PM	6-8Ω	100465	3A15TZ6.6	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	RCA Victor PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M1	79791	51-1J	C (J)	51-1	PFT-1	

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

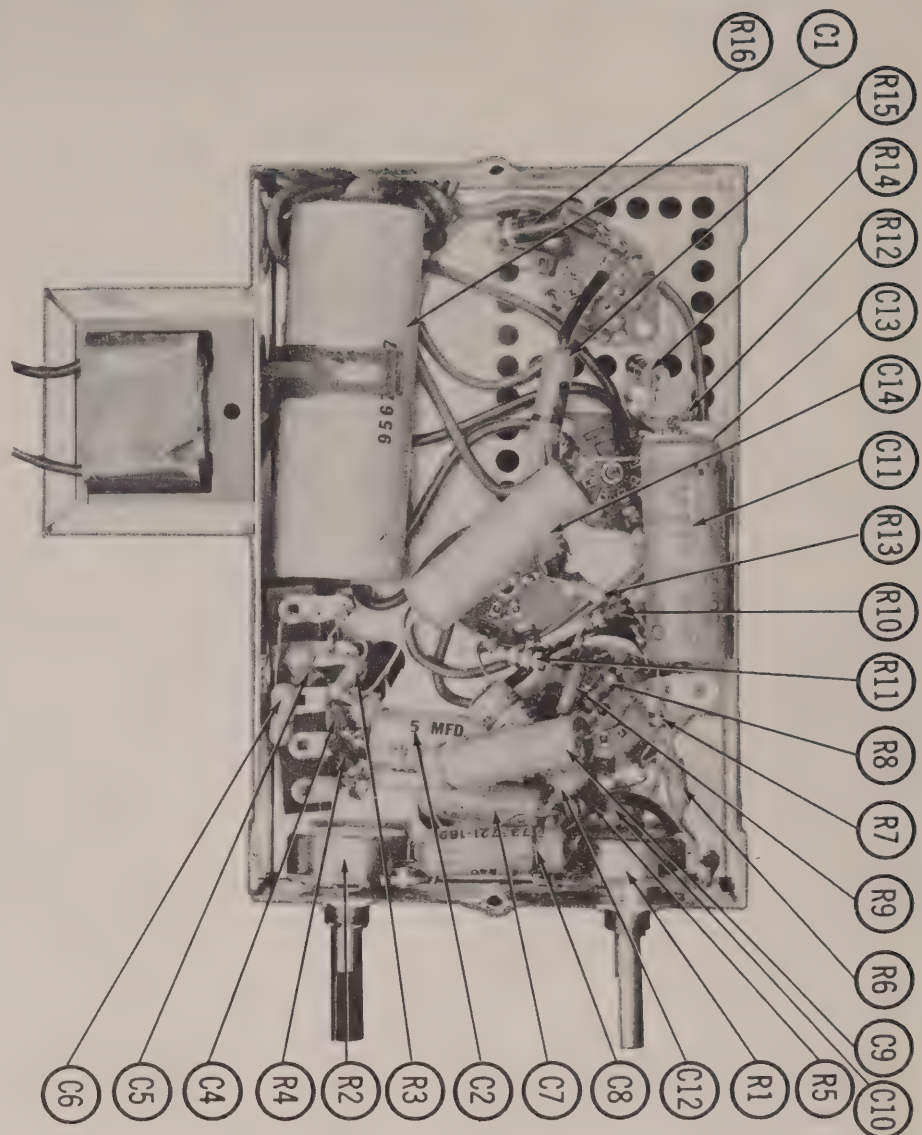
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	RCA Victor PART No.	JENSEN PART No.	WALCO PART No.	
M2	79849	†S-63LP or ♦S-63LPD	†W-76MGS or ♦W-76MGD	† Jewel ♦ Diamond

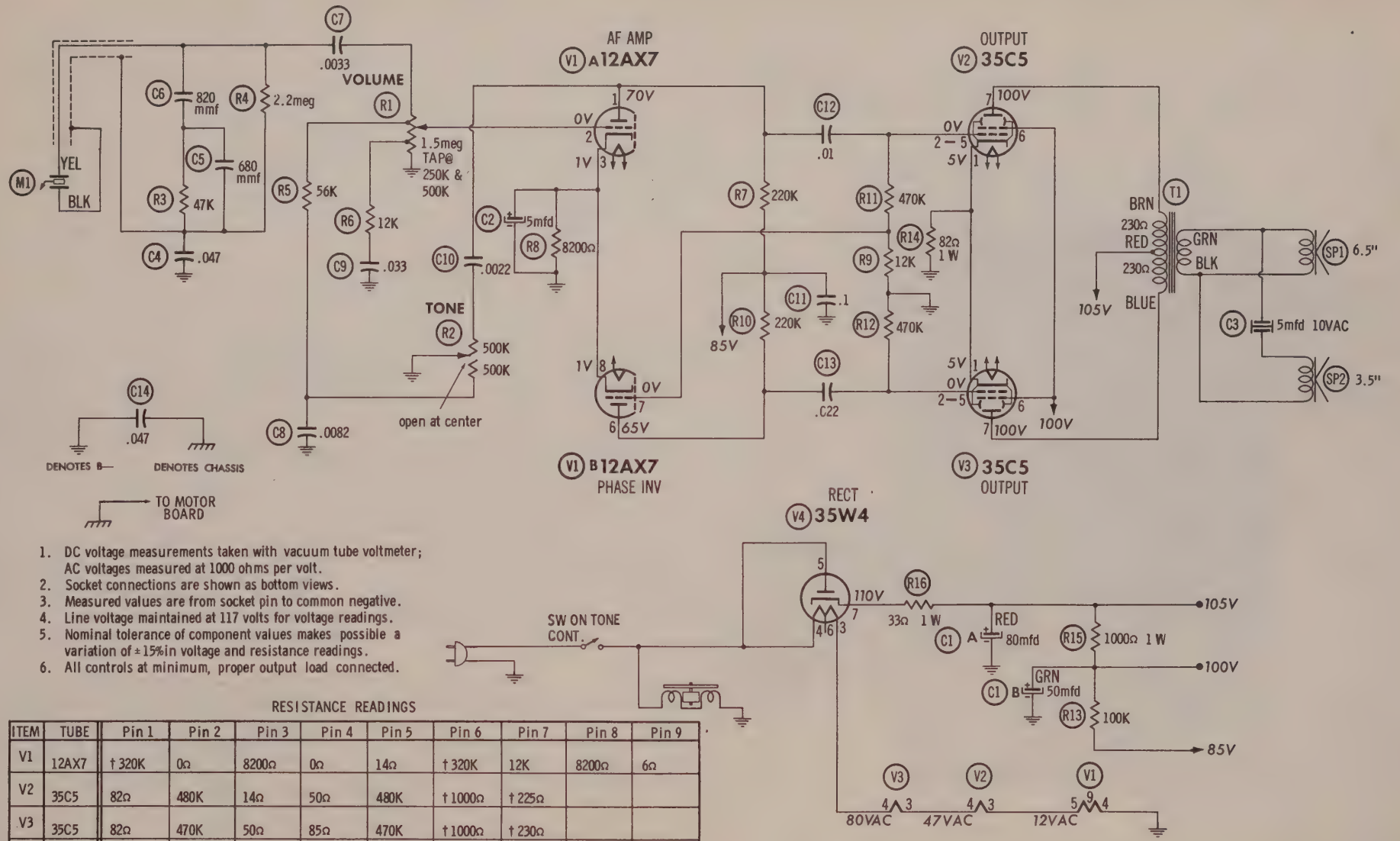
MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
	Knob	102679	Control, Mahogany Models
	Knob	102680	Control, Oak Models
	Knob	103167	Control, Maple Models
	Knob	101685	Record Changer Control

CHASSIS—BOTTOM VIEW



RCA VICTOR MODEL 7-HF-46 (Ch. RS-159)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	† 320K	0Ω	8200Ω	0Ω	14Ω	† 320K	12K	8200Ω	6Ω
V2	35C5	82Ω	480K	14Ω	50Ω	480K	† 1000Ω	† 225Ω		
V3	35C5	82Ω	470K	50Ω	85Ω	470K	† 1000Ω	† 230Ω		
V4	35W4	TP	NC	85Ω	120Ω	120Ω	115Ω	50K		

† MEASURED FROM PIN 7 OF V4.
NC NO CONNECTION
TP TIE POINT

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RCA VICTOR MODEL 14-S-7052 (Ch. KCS102B)

TRADE NAME	RCA Victor	MODELS	CHASSIS
		14-S-7052, 14-S-7070, 14-S-7071, 14-S-7074	KCS102B
		14-S-7052U, 14-S-7070U, 14-S-7071U, 14-S-7074U	KCS102D
MANUFACTURER	Radio Corp. of America, RCA Victor Tele. Div., Camden 8, N. J.		
TYPE SET	Television Receiver		
TUBES	Fifteen		
POWER SUPPLY	110-120 Volts AC - 60 Cycles	RATING 150 Watts, 1.38 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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RCA VICTOR MODELS 14-S-7052, U, 14-S-7070, U, 14-S-7071, U, 14-S-7074, U, (Ch. KCS102B, D)

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 push-on type knobs from side of cabinet.
2. Remove 3 metal screws holding front trim and remove trim.
3. Bend 2 tabs at top of safety glass up and remove safety glass.
4. Remove 6 metal screws and remove rear cover.
5. Remove speaker leads.
6. Remove 1 metal screw holding chassis to brace at top.
7. Place receiver front down on a pad.
8. Remove 3 chassis screws from bottom.
9. Lift cabinet off of chassis.
10. Remove 2 speaker nuts and remove speaker.

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MODEL	CHASSIS
14-S-7052	KCS102B

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

1. Remove 3 metal screws from bottom holding front trim and remove trim.
2. Bend up tabs at top of safety glass and remove safety glass.
3. Caution: Use only a soft cloth and water to clean safety glass.

FOCUS

Adjust Ion trap for best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The horizontal frequency coil is located on the control panel of the chassis and is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally.

FUSES

One fuse is used for horiz. sweep circuit protection. (For location see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

RCA VICTOR MODELS 14-S-7052, U, 14-S-7070, U, 14-S-7071, U, 14-S-7074, U, (Ch. KCS102B, D)

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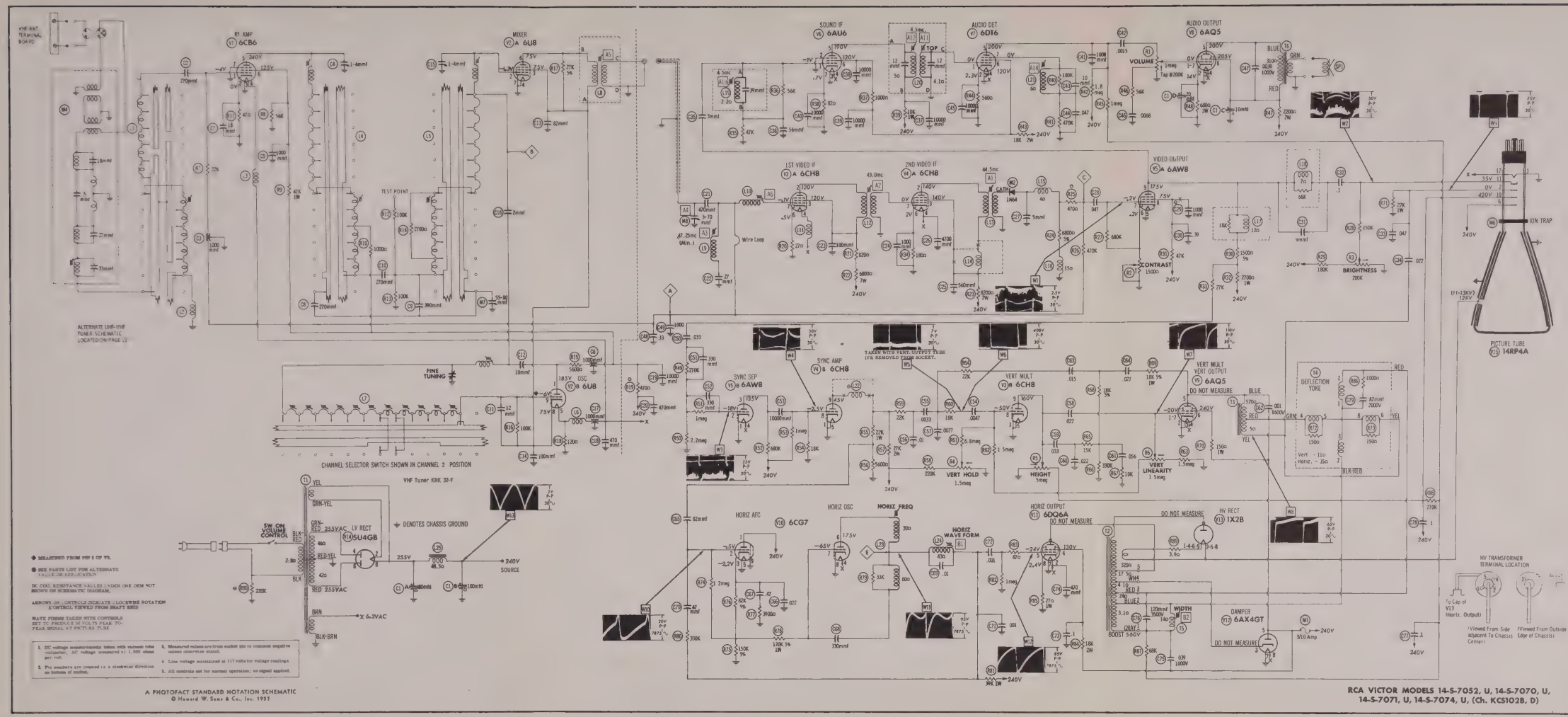

◆ SELECTED FROM PIN 5 OF V5.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings
5. All controls set for normal operation; no signal applied.

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CHASSIS TOP VIEW

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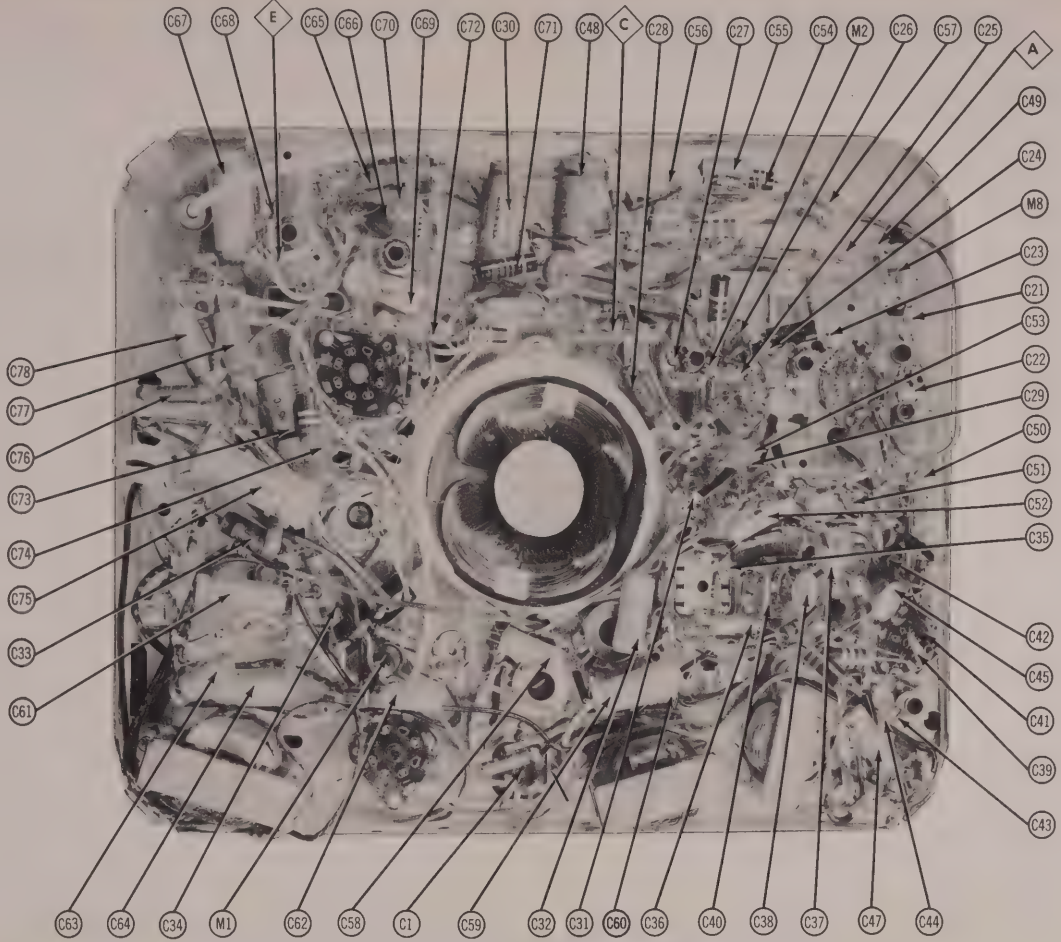

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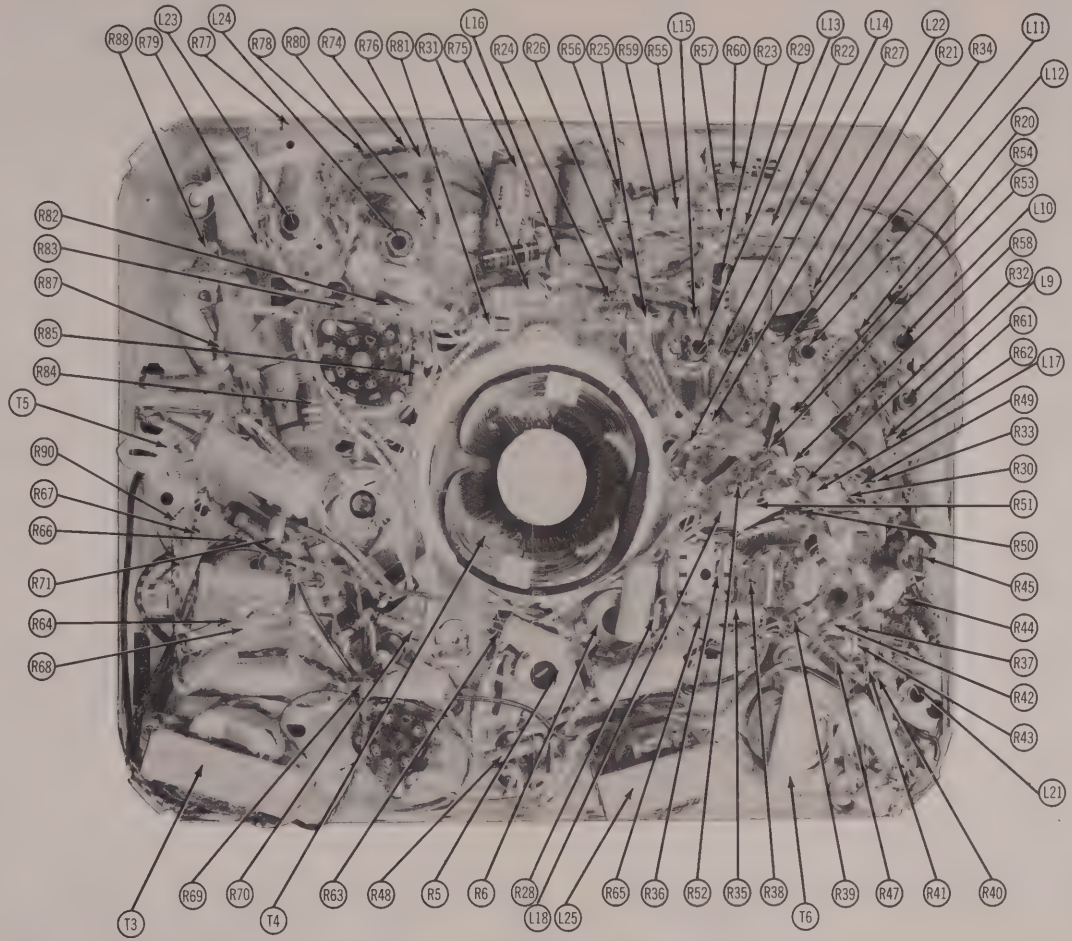
CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



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CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Connect a 1000 ohm potentiometer across a 7.5 volt bias battery (capable of an appreciable current drain). Connect the potentiometer to point Ⓐ and the positive lead of the battery to chassis. Set the potentiometer arm to provide -3.5 volts at point Ⓐ. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	1500MMF	High side to point Ⓑ. Low side to tuner chassis.	Not used.	45.5MC	Any unused channel.	USE VTVM DC probe to point Ⓒ. Common to chassis.	A1	Use only enough generator output to provide usable indication on VTVM. Adjust for maximum deflection.
2.	"	"	"	43.0MC	"	"	A2	"
3.	"	"	"	47.25MC	"	"	A3	Increase generator output to maintain 3 volts on VTVM when this adjustment is made. Adjust A3 for MINIMUM deflection.
4.	"	High side to point Ⓑ. Low side to chassis. Use shortest leads possible with no more than 1 inch exposed on end of hot lead.	44MC (10MC Swp)	43.0MC 45.75MC	"	Vert. amp. thru detector probe (Fig. 1) to pin 2 (plate) of 6CH8 (V3). Low side to chassis.	A4, A5, A6	Preset A4 approximately 4 full turns counter clockwise. Connect a 180Ω carbon resistor from pin 2 (plate) of 6CH8 (V3) to pin 3 (screen) of same tube. Adjust bias battery to obtain -3.5 volts at point Ⓐ. If a separate marker generator is used, couple loosely to detector probe (used for scope). Adjust A5 and A6 for maximum amplitude with 45.75MC marker at 45% on response curve. Adjust A4 clockwise to obtain response curve as shown in Fig. 2 with markers as indicated. Remove 180Ω carbon resistor from V3.
5.	"	"	"	41.25MC 43.0MC 45.0MC 45.75MC	"	Vert. amp. thru 10K to point Ⓒ. Low side to chassis.	A1, A2, A3	Adjust sweep generator output to provide 5 volts peak to peak on scope. If separate marker generator is used, loosely couple to grid of first video IF amp. (V3). Retouch A1 and A2 to obtain response as shown in Fig. 3 with markers as shown. Increase the sweep generator output ten times and retouch A2 to place 41.25MC marker at approximately 5% on curve.

ADDITIONAL VIDEO IF ALIGNMENT FOR UHF MODELS

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	1500MMF ceramic capacitor and 1000Ω carbon resistor in series.	High side to front terminal of 1N82 crystal holder after removing crystal apperture cover. Use shortest leads possible and connect low side to tuner case.	44MC (10MC Swp)	41.25MC 45.75MC	UHF Between channels 68 and 69.	Connect a 220Ω carbon resistor in series with 1500MMF between pin 1 (plate) of 6BQ7A (RF Amp.) and ground with the resistor next to ground. This point is accessible through the hole in the left side of the tuner. Connect the vert. amp. of the scope to the junction of the resistor and the capacitor thru the detector probe (Fig. 1)	A7, A8	Adjust the bias for -3.5 volts at point Ⓐ. Set the sweep generator output to produce .5 volts peak to peak on scope. Adjust A7 and A8 for maximum gain with marker positioned as in Fig. 4.
7.	"	"	"	"	"	Move the resistor-capacitor network along with the detector probe from the plate of the 6BQ7A to point Ⓓ.	A9, A10	Adjust A9 and A10 for maximum gain with markers as in Fig. 4. Remove the resistor, capacitor and detector probe from point Ⓓ.
8.	Two 130Ω carbon resistors.	Across VHF antenna terminals with 130Ω in each lead.	See VHF freq. chart.	See VHF freq. chart.	All VHF channels.	Vert. amp. thru 10K to point Ⓒ. Low side to chassis.	A1, A2	Check for response similar to Fig. 5 on each VHF channel. Correct for any overall tilt that is essentially the same on all channels by retouching A1 and A2.
9.	"	Across UHF antenna terminals with 130Ω in each lead.	See UHF freq. chart.	See UHF freq. chart.	All UHF channels.	"	A9, A10	Check for response similar to Fig. 5 on all UHF channels, retouching A9 and A10, if necessary, to correct for any overall tilt. Remove test equipment and bias battery. Do not retouch any adjustments other than A9 and A10.

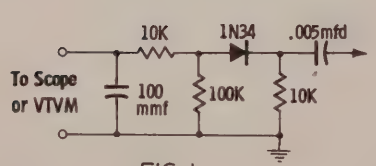


FIG. 1

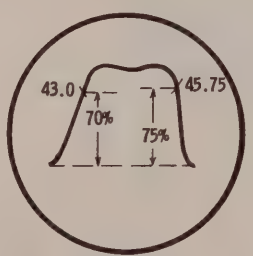


FIG. 2

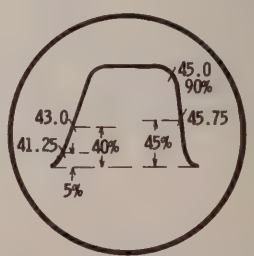


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

SOUND IF ALIGNMENT

Connect the negative lead of a 10 volt bias supply or battery to point A and positive to chassis.
Turn contrast control fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01MFD	High side to pin 7 (grid) of 6AW8 (V5). Low side to chassis.	4.5MC (unmod)	Any unused channel.	DC probe thru detector probe (Fig. 6) to pin 1 (grid) of 6DT6 (V7). Common to chassis.	A11, A12, A13	Connect a short jumper from pin 7 (suppressor grid) of the 6DT6 (V7) to chassis. Preset A11 and A12 fully counter clockwise. Adjust A11, A12 and A13 for maximum meter deflection. Adjust signal generator output to maintain between 1 and 2 volts on meter when adjustments are peaked. Remove the VTVM, detector probe and the short from pin 7 of V7.

11. Remove the signal generator and tune in the strongest channel available in the area. Connect the scope leads across the speaker voice coil leaving the speaker connected. Turn A14 fully counter clockwise. While observing the scope and at the same time, listening to the speaker, adjust A14 clockwise until a peak is observed and heard. Continue turning clockwise until a second louder peak is obtained and adjust for a maximum indication on the scope. Remove the scope leads. Connect one end of a 1000 ohm potentiometer to chassis and the center arm to pin 1 (grid) of the 6AU6 (V6). Decrease the volume by running the center arm of the 1000 ohm potentiometer toward chassis until distortion is heard in the sound. With the distorted output, readjust A11 for maximum audio output. Use a voice signal only while making this adjustment. Remove the 1000 ohm potentiometer.

ALTERNATE SOUND IF ALIGNMENT

Connect bias as under "Sound IF Alignment".
Turn Contrast control fully clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	.01MFD	High side to pin 7 (grid) of 6AW8 (V5). Low side to chassis.	4.5MC (400∿ FM 15KC Swp.)	Not used.	Any unused channel.	Across the voice coil of speaker with speaker connected.	A11, A12, A13, A14	Preset A14 fully counter clockwise. Adjust A14 to second peak turning clockwise. Volume control should be set for .7 volts peak to peak on scope when A14 is peaked. Reduce the output of the generator slowly and adjust A11 until oscillation occurs at each end of the modulation swing as in Fig. 7. Adjust A12 and A13 for maximum gain and symmetry as in Fig. 7.

TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

TELEVISION CHANNEL FREQUENCIES

Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier	Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier	Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier	Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier
2	54-60	55.25	59.75	23	524-530	525.25	529.75	44	650-656	651.25	655.75	64	770-776	771.25	775.75
3	60-66	61.25	65.75	24	530-536	531.25	535.75	45	656-662	657.25	661.75	65	776-782	777.25	781.75
4	66-72	67.25	71.75	25	536-542	537.25	541.75	46	662-668	663.25	667.75	66	782-788	783.25	787.75
5	76-82	77.25	81.75	26	542-548	543.25	547.75	47	668-674	669.25	673.75	67	788-794	789.25	793.75
6	82-88	83.25	87.75	27	548-554	549.25	553.75	48	674-680	675.25	679.75	68	794-800	795.25	799.75
7	174-180	175.25	179.75	28	554-560	555.25	559.75	49	680-686	681.25	685.75	69	800-806	801.25	805.75
8	180-186	181.25	185.75	29	560-566	561.25	565.75	50	686-692	687.25	691.75	70	806-812	807.25	811.75
9	186-192	187.25	191.75	30	566-572	567.25	571.75	51	692-698	693.25	697.75	71	812-818	813.25	817.75
10	192-198	193.25	197.75	31	572-578	573.25	577.75	52	698-704	699.25	703.75	72	818-824	819.25	823.75
11	198-204	199.25	203.75	32	578-584	579.25	583.75	53	704-710	705.25	709.75	73	824-830	825.25	829.75
12	204-210	205.25	209.75	33	584-590	585.25	589.75	54	710-716	711.25	715.75	74	830-836	831.25	835.75
13	210-216	211.25	215.75	34	590-596	591.25	595.75	55	716-722	717.25	721.75	75	836-842	837.25	841.75
14	470-476	471.25	475.75	35	596-602	597.25	601.75	56	722-728	723.25	727.75	76	842-848	843.25	847.75
15	476-482	477.25	481.75	36	602-608	603.25	607.75	57	728-734	729.25	733.75	77	848-854	849.25	853.75
16	482-488	483.25	487.75	37	608-614	609.25	613.75	58	734-740	735.25	739.75	78	854-860	855.25	859.75
17	488-494	489.25	493.75	38	614-620	615.25	619.75	59	740-746	741.25	745.75	79	860-866	861.25	865.75
18	494-500	495.25	499.75	39	620-626	621.25	625.75	60	746-752	747.25	751.75	80	866-872	867.25	871.75
19	500-506	501.25	505.75	40	626-632	627.25	631.75	61	752-758	753.25	757.75	81	872-878	873.25	877.75
20	506-512	507.25	511.75	41	632-638	633.25	637.75	62	758-764	759.25	763.75	82	878-884	879.25	883.75
21	512-518	513.25	517.75	42	638-644	639.25	643.75	63	764-770	765.25	769.75	83	884-890	885.25	889.75
22	518-524	519.25	523.75	43	644-650	645.25	649.75								

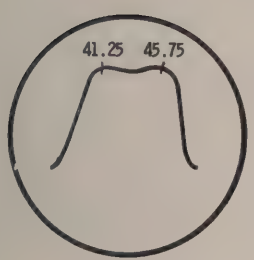


FIG. 4

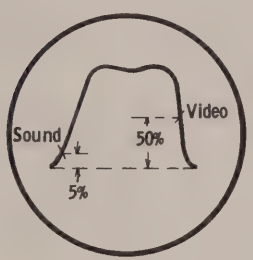


FIG. 5

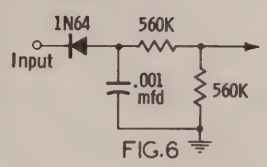
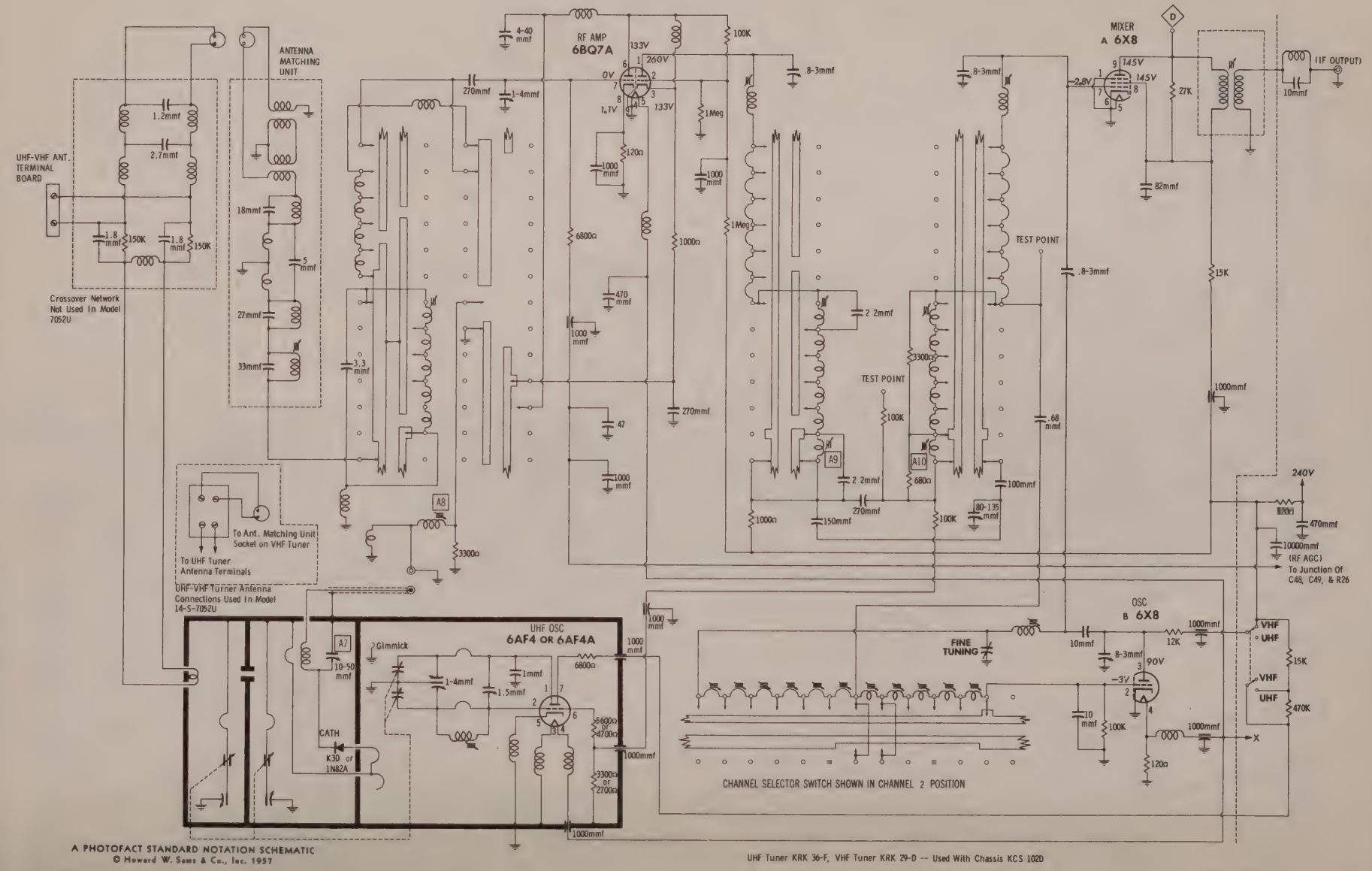


FIG. 6

FIG. 7


UHF-VHF ANT. TERMINAL BOARD
Crossover Network Not Used In Model 7052U
ANTENNA MATCHING UNIT
RF AMP 6BQ7A
MIXER A 6X8
OSC B 6X8
UHF OSC 6AF4 OR 6AF4A
TEST POINT
TEST POINT
FINE TUNING
To Ant. Matching Unit Socket on VHF Tuner
To UHF Tuner Antenna Terminals
UHF-VHF Tuner Antenna Connections Used In Model 14-S-7052U
(IF OUTPUT)
(RF AGC) To Junction Of C48, C49, & R26
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 2 POSITION
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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UHF Tuner KRK 36-F, VHF Tuner KRK 29-D -- Used With Chassis KCS 102D

ALTERNATE UHF-VHF TUNER SCHEMATIC

TUBE PLACEMENT CHART

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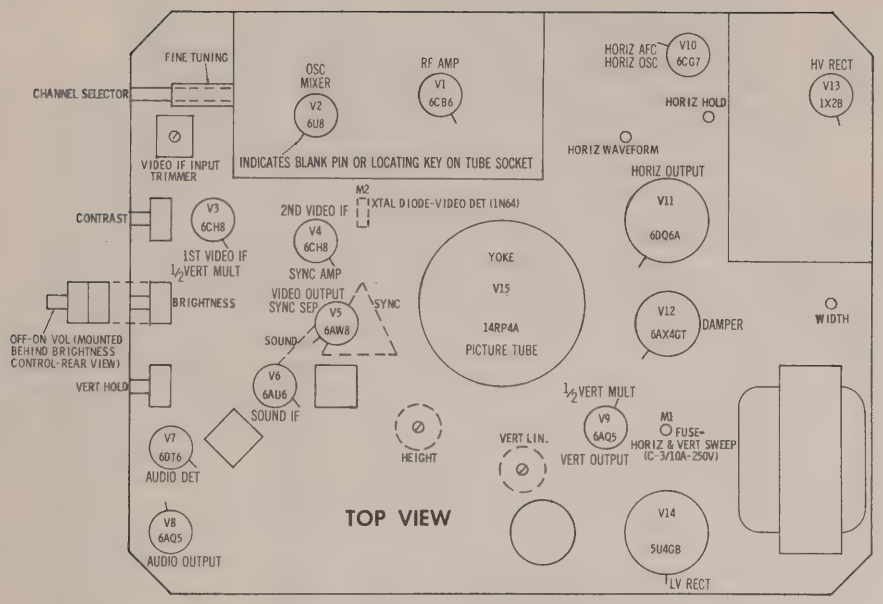


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V14

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, Diode (M2), V5
No pic, no sound, has snow - V1, V2
No pic, has sound, has raster - V5, V15
Has pic, no sound - V6, V7, V8

SYNC FAILURE
No vert. sync - V3, V4, V5, V9
No horiz. sync - V4, V5, V10
No vert. or horiz. sync - V4, V5

SWEEP FAILURE
No raster, has sound - V10, V11, V12, V13, V15, Fuse (M1)
No vertical deflection - V3, V9
Poor vert. linearity or foldover - V3, V9
Poor horiz. linearity or foldover - V10, V11, V12
Narrow picture - V10, V11, V12, V14
Vert. off freq. - V3, V4, V5, V9
Horiz. off freq. - V4, V5, V10

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amp.	6CB6	
V2	Mixer-Osc.	6U8	
V3	1st Video-IF Amp.-2nd Vert. Multi.	6CB8	
V4	2nd Video-IF Amp. - Sync Amp.	6CH8	
V5	Video Output-Sync Sep.	6AW8	
V6	Sound IF Amp.	6AU6	

ITEM No	USE	TYPE	NOTES
V7	Audio Det.	6DT8	
V8	Audio Output	6AQ5	
V9	Vert. Mult.-Vert. Output	6AQ5	
V10	Horiz. AFC-Horiz. Osc.	6CG7	
V11	Horiz. Output	6DQ6A	
V12	Damper	6AX4GT	
V13	HV Rectifier	1X2B	
V14	LV Rectifier	5U4GB	

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	RCA Victor PART No.	CBS PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	
V15	14RP4A		14RP4A ①	14RP4A ②	① Aluminized ② Silver-Screen 85°

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA					
	CAP	VOLT	RCA Victor PART No.	ARROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	350	10311	AFH4-58-80	CORNELL-DUBILIER PART No. CORB 80-350 / CUBB 350	MALLORY PART No. FP350-1 / TC80		T-537 / MT-4580	H3253*
B	100	350							
C	40	300							
D	20	50							

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING		REPLACEMENT DATA							NOTES
	CAP	VOLT	RCA Victor PART No.	ARROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	370		7783S	BPD-00027	DD-27,	LUT27	ED-270	UC-5327	5GA-T27	
C3	1000		7784	EF-001	MFT-1000				5GC-D1	
C4	1-4		7653S		839-4		31S-E	CT55		
C4	1000		7752	BPD-001	DD-102	BYA5D1	ED-1000	DC53	5HK-D1	
C8	1000		7784	EF-001	MFT-1000				5GC-D1	
C7	18		5781T	BPD-4118	TCC-18	C10Q18C	TCO-18			
C8	370		7783S	BPD-00027	DD-27,	LUT27	ED-270	UC-5327	5GA-T27	
C9	390		7784J	BPD-00039	DD-391	LUT39	ED-390	UC-5339	5GA-T39	
C10	270		7783S	BPD-00027	DD-271	LUT27	ED-270	UC-5327	5GA-T27	
C11	12		7971S	BPD-00001	DD-120	LUT12	ED-12	UC-5413	5GA-Q12	
C12	10		7784S	BPD-4110	TCZ-10	C10Q1C	TCO-10		5GC-C1	
C13	82		7860S		D8-82	L10Q82	ED-82		5GA-Q82	
C14	100		7973S	BPD-001	DD-101	LUT1	ED-100	UC-531	5GA-T1	
C15	1-4		7653S		839-4		31S-E	CT55		
C16	7			NPO-61 2 2	TCZ-2, 2	C10V2C	TCO-2, 2		5TCCB-V22	
C17	1000		7784	EF-001	MFT-1000				5GC-D1	
C19	470		7729S	BPD-00047	DD-471	BYA10D47	ED-470	UC-5347	5GA-T47	
C20	1000		7729S	BPD-001	DD-103	BYA5B1	ED-1000	DC51	5HK-B1	
C20	470		7728S	BPD-00047	DD-471	BYA10D47	ED-470	UC-5347	5GA-T47	
C21	470		7729S	BPD-00047	DD-471	BYA10D47	ED-470	UC-5347	5GA-T47	
C22	27		7948S	NPO-61 27	TCZ-27	C10Q27C	TCO-27			
C23	100			N750-61 100	TCN-100	C10T1C	TCT-100	MT-531	5TCU-T1	
C24	1000		7725S	BPD-001	DD-102	BYA5D1	ED-1000	DC53	5HK-D1	
C25	560		10503S	BPD-00056	DD-561	BYA10T56	ED-560	UC-5356	5GA-T56	
C26	4700		7547S	BPD-00047	D6-472	BYA10D47	GP-4700	UC-5347	5HK-D47	
C27	5		7768S	NPO-61 5	TCZ-5	C10V5C	TCO-5	ZT-585	5TCCB-V47	
C28	047	200	7921-A	BPD-03	DF-303	CUB3S47		GEM-2167	5TM-S47	
C29	1000		7725S	BPD-001	DD-103	BYA5D1	ED-1000	DC53	5HK-D1	Note 1
C30	39	400	10303A	P45BN-39				GEM-4029	5TM-P39	
C31	9		5753S	N750-61 9	TCN-9	C10T9C	TCT-9	MT-561	5TCU-T4	
C33	1	400	7742S	P45BN-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C33	047	200	7921-A	BPD-03	DF-303	CUB3S47		GEM-2167	5TM-S47	
C34	022	400	7993S	BPD-03	DF-303	CUB4S22	KD-03	GEM-4122	4TM-S22	
C35	3		10241S	N750-61 3	TCN-3		TCT-3			
C36	56		7792S	NPO-61 56	TCZ-56	C10Q56C	TCO-56			
C37	1000		7725S	BPD-01	DD-103	BYA5B1	GP-10000	DC511	5HK-B1	
C38	10000		7726S	BPD-01	DD-103	BYA5B1	GP-10000	DC511	5HK-B1	
C39	1000		7725S	BPD-01	DD-103	BYA5B1	GP-10000	DC511	5HK-B1	
C40	1000		7725S	BPD-01	DD-103	BYA5B1	GP-10000	DC511	5HK-B1	
C41	1000		10323A	BPD-001	DD-102	BYA5D1	ED-1000	DC531	5HK-D1	
C42	.0015	600	10302S	BPD-0015	DD-152	CUB6D15		GEM-6315	6TM-D15	
C43	10		10317A							
C44	.047	200	7892J-A	BPD-03	DF-303	CUB3S47		GEM-2167	5TM-S47	
C45	10000		7726S	BPD-01	DD-103	BYA5B1	GP-10000	DC511	5HK-B1	
C46	.0068	200	10307B	BPD-0068		CUB2D68		GEM-2368	5TM-D68	
C47	.0039	1000	7890H	P10B2N-004		CUB1D04		GEM-1039	1TM-D39	
C48	.33	200	10307B	P35B4N-33		CUB2P33		GEM-2033	3TM-P33	
C49	047		7792J	BPD-001	DD-103	BYA5D1	ED-1000	DC531	5HK-D1	
C50	.033	600	10323T	BPD-03	DF-303	CUB6S33		GEM-6133	6TM-S33	
C51	330		10012S	BPD-00033	DD-331	L10T33	ED-330	UC-5333	5GA-T33	
C52	330		10012S	N750-61 330	TCN-330	L10T33C	TCT-330		5TCU-T33	
C53	10000		7726S	BPD-01	DD-103	BYA5B1	GP-10000	DC511	5HK-S1	
C54	.0047	600	7892D	BPD-0047	D6-472	CUB6S47	GP-4700		6TM-D47	
C55	.0033	600	10217A	BPD-0033	D6-332	CUB6D33	GP-3300	GEM-6233	6TM-D33	
C56	01	600	10303B	BPD-01	DD-103	CUB6S1	GP-10000	GEM-6110	6TM-S1	
C57	.0027	600	10323A	BPD-003	D6-272	CUB6D27	GP-2700	GEM-6227	6TM-D27	
C58	022	600	10303S	BPD-02	DF-203	CUB6S22	ED-02	GEM-6122	6TM-S22	
C59	033	600	7755S	BPD-03	DF-303	CUB6S33		GEM-6133	6TM-S33	
C60	022	400	7993S	BPD-02	DF-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C61	056	600	7757S	BPD-05	DF-503	CUB6S56		GEM-6156	6TM-S56	
C63	001	1800	7784S	P16B8N-001		DD30-102	CUH6D1	GEM-1621	1TM-D1	
C63	015	200	7850S	BPD-015	DF-203	CUB2S15	ED-015	GEM-2115	2TM-S15	
C64	.047	600	7892J	BPD-03	DF-303	CUB6S47		GEM-6147	6TM-S27	
C65	82		7847A	1488-000082		5W5Q82	KD-82	UC-5482	8S-458	
C66	022	400	7992S	BPD-02	DF-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C67	47	200	7916S	P29BN-47		CUB2P47		GEM-2047	2TM-P47	
C68	130		7847S	1488-000033		5W5T33	ED-330	UC-5333	8S-333	
C69	01	600	7759S	BPD-01	DD-103	CUB6S1	GP-10000	GEM-61	6TM-S1	
C70	47		7903S	1488-000047	DD-470	5W5Q47	ED-47	UC-5447	8S-447	
C71	001	600	7924S	BPD-001	DD-102	CUB6D1	GP-1000	GEM-621	6TM-D1	
C72	001	600	7954S	BPD-001	DD-102	CUB6D1	GP-1000	GEM-621	6TM-D1	
C73	1	400	7841S	P45BN-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C74	470		7729S	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-Q47	
C75	039	1000	7473S	P10B6N-04		DF-403		GEM-10139	1GM-S39	
C76	130	3500	7963S			DD60-131				
C77	1.1	400	7742S	P45BN-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C78	1.1	100	7742S	P2BN-1	DF-104	CUB2P1		GEM-101	1TM-P1	
C79	82	2000			DD8-820	HVA20Q82				

Note 1: Not used in some versions.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	RCA Victor PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No	MALLORY PART No	
R1A	1Meg	1	10310S	BT-72	A47F-1Meg	UT440	Not Reg.	Volume - Tap @ 300K
B	Shaft			Not Reg.	FS-3		Not Reg.	
C	Switch			KB-1	SWS-12		US-28	
R2A	1500Ω	1	10310S	B-8	A47-1500-S	QJ47-109	TA1S2L	Contrast
B	Shaft			Not Reg.	FS-3	Not Reg.	Not Reg.	
R3A	200K	1	10310S	B-46	A47-200K-S	QJ1-129	U43	Brightness
B	Shaft			Not Reg.	FS-3	Not Reg.	Not Reg.	
R4A	1.5Meg	1	10310T	Not Reg.	A47-1.5Meg-S	QJ1-138	TA1S5L	Vertical Hold
B	Shaft			Not Reg.	FS-3	Not Reg.	Not Reg.	
R5A	5Meg	1	10310	AB-87	A47-5Meg-S	QU-141	PTA5L	Height
B	Shaft			AK-1	FKS-1/4	TM1-KIT	Not Reg.	
R6A	1.5Meg	1	10310S	EK-642	A47-1.5Meg-S	QU-135	TA1S5L	Vertical Linearity
B	Shaft			Not Reg.	FKS-1/4	TM1-KIT	Not Reg.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R7	22K		5032J3	BTS-22K	
R8	56K		5032S6	BTS-56K	
R9	47K	1	5123A7	BTA-47K	
R10	1000Ω		5032J0	BTS-1000	
R11	470Ω		5030A7	BTS 47	
R12	100K		5032J0	BTS-100K	
R13	100K		5032J0	BTS-100K	
R14	2700Ω		5032J27	BTS-2700	
R15	5600Ω		5032S6	BTS-5600	
R16	100K		5032J0	BTS-100K	
R17	27K 5%		5032J7	BTS-27K 5%	
R18	120Ω		5032J2	BTS-120	
R19	470Ω			BTS-470	Note 1
R20	270Ω		5030Z7	BTS-27	
R21	820Ω		5032J2	BTS-820	
R22	6800Ω	2	10217		
R23	8200Ω	2	5323S3	BTS-8200	
R24	6800Ω 5%		5032S6	BTS-6800 5%	
R25	470Ω			BTS-470	Note 1
R26	470K		5032A7	BTS-470K	
R27	680K		5032S8	BTS-680K	
R28	150K		5032S5	BTS-150K	
R29	180K		5032S8	BTS-180K	
R30	15000 5%		5032S3	BTS-15000	
R31	47K	1	5123A7	BTA-47K	
R32	8700Ω	1	5123Z7	BTA-2700	
R33	27K		5032J7	BTS-27K	
R34	180Ω		5032J8	BTS-180	
R35	47K		5032A7	BTS-47K	
R36	56K		5032S6	BTS-56K	
R37	1000Ω		5032J0	BTS-1000	
R38	82Ω		5032S2	BTS-82	
R39	10K	1	5123J0	BTA-10K	
R40	180K		5032S8	BTS-180K	
R41	470K		5032A7	BTS-470K	
R43	1.5Meg		5032J5	BTS-1.5Meg	
R43	18K	2	5323S8	BTS-18K	
R44	560Ω		5032S6	BTS-560	
R45	1Meg		5032S0	BTS-1Meg	
R46	56K		5032S6	BTS-56K	
R47	2200Ω	2	5323S3	BTS-2200	
R48	680Ω	1	5123S8	BTA-680	

ITEM No	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R49	270K		5032A7	BTS-270K	
R50	2.2Meg		5032S3	BTS-2.2Meg	
R51	1Meg		5032S0	BTS-1Meg	
R52	560K		5032S6	BTS-560K	
R53	1Meg		5032S0	BTS-1Meg	
R54	18K		5032S8	BTS-18K	
R55	22K	1	5123J3	BTA-22K	
R56	5600Ω		5032S6	BTS-5600	
R57	27K	2	5323J7	BTS-27K	
R58	220K		5032A3	BTS-220K	
R59	33K		5032J3	BTS-33K	
R60	10K		5032J0	BTS-10K	
R61	6.8Meg		5032S6	BTS-6.8Meg	
R62	1.5Meg		5032S5	BTS-1.5Meg	
R63	1.5Meg		5032S5	BTS-1.5Meg	
R64	22K		5032J2	BTS-22K	
R65	15K		5032J5	BTS-15K	
R66	330K		5032A3	BTS-330K	
R67	10K		5032J0	BTS-10K	
R68	18K 5%		5032S8	BTS-18K 5%	
R69	18K 5%	1	5123J8	BTA-18K 5%	
R70	100Ω	1	5123J0	BTA-100	
R71	33K	1	5032J3	BTA-33K	
R72	150Ω				
R73	150Ω				
R74	1.5Meg		5032J5		
R75	15K 5%		5032J5	BTS-150K 5%	
R76	82K 5%		5032S2	BTS-82K 5%	
R77	3900Ω		5032S3		
R78	120K 5%	1	5123J2	BTA-120K 5%	
R79	33K		5032J3	BTS-33K	
R80	330K		5032A3		
R81	39K	1	5123J3		
R82	1Meg		5032S0	BTS-1Meg	
R83	47Ω		5030A7		
R84	18K	2	5323J8	BTS-18K	
R85	27Ω	1	5123Q7	BTA-27	
R86	1000Ω		5032J0		
R87	68K		5032S8		
R88	270K		5032A7	BTS-270K	
R89	5.6Ω		10303D	BW 1/2-5.6	
R90	220K		5032A23	BTS-220K	Note 2

Note 1. A 10000Ω ② 1/2 W Resistor Used In Some Versions (Part #5032H0).
Note 2. A 150Ω ① 1/3 W Resistor Used in Some Versions (Part #5024G0).

TRANSFORMER (POWER)

ITEM No	REPLACEMENT DATA								
	PRI.	SEC. 1	SEC. 2	SEC. 3	RCA Victor PART No.	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	117VAC	500VCT	5V	6.3V	10309H					
	@ 1.3A	@ .250A	@ 3A	@ 7.2A						

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA							
		RCA Victor PART No	Halldorson PART No	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T2	Horiz. Output Trans.	10309Z					HO-272*	FLY-1007	
T3	Vert. Output Trans.	10309Y	21807 ①	A-2824 ①	V315 ①		VO-103	26S75 ②	A-109X ② ③
T4A	Yoke (90°) Horiz (53MH)	10311S ②					DY-24A ②		
B	Vert.(3MH)	10311S ③							
		10239S ②							
T5	Width Coil (3-17MH)	10310A	RY800 ②	MWC-11		20R15	WC-11 ② ③	WC-15 ②	WC-12 ①

① Cut and tape blanking lead.
② Use 15 to 1 turns ratio.
③ Connect as auto transformer.
④ Drill new mtg. hole(s).
⑤ Includes resistors R72, R73, R86 and capacitor C78.
⑥ Take rear cover and centering device.
⑦ Take mounting clamp.
⑧ Use original rear cover and centering device.
⑨ Use terminals 1 and 2.
Ⓐ Use black and white terminals.
Ⓑ Use red and blue terminals.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL (CONNECTIONS)	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	5					5	5	
	4					4	4	
	3					3	3	
	2					2	2	
	1					1	1	
Locked Width Coil Access	1 & 2					1 & 2	1 & 2	

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T6	6.1K	3-6Ω	10304	22115	A-2927 ①	A-8146	34S68	S-6X ①	① Drill one new mtg. hole.

SPEAKER

ITEM No.	TYPE				REPLACEMENT DATA		NOTES
	SIZE	FIELD	V C	IMP	RCA Victor PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω		7969S	4A07	

COILS (RF-IF)

ITEM No.	USE	RCA Victor PART No.	NOTES
L1	VHF Ant. Coils	7975A	Stator complete with rotor, includes C7.
L2	RF Choke	7985S	
L3	Fil. Choke	7975S	
L4	VHF RF Coils	7972S	Stator complete with rotor. Includes C15 and R5.

ITEM No.	USE	RCA Victor PART No.	NOTES
L5	VHF Mixer Coils	7973S	Stator complete with rotor. Includes C16, C18, C23, R6, R7 & R8.
L6	Fil. Choke	7973G	
L7	VHF Osc. Coils	7972A	Stator complete with rotor.
L8	Conv. Plate	10304S	

ITEM No.	USE	REPLACEMENT DATA				NOTES
		RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MULLER PART No.	
L9	47.25MC Trap	10310G	30-1049	TV-153	6225	
L10	1st Video IF	10309U		TV-151	6225	
L11	Fil. Choke	7947T	19-4215	TV-150	BC-537	5.4 Microhenries
L12	2nd Video IF	10309T	17-4524	TV-150	6224	
L13	3rd Video IF	10309S	17-4524	TV-150	6224	
L14	Shunt Peaking Coil					.22 Microhenries
L15	Series Peaking Coil	10188	19-3096	TV-180	6176	36 Microhenries
L16	Shunt Peaking Coil	10307T	19-4600		6184	240 Microhenries
L17	Shunt Peaking Coil	10309Q	19-3300*		6180*	300 Microhenries; Wound on 1Mk resistor.
L18	Series Peaking Coil	10303S	19-3154		6183A	120 Microhenries; Wound on 56Ω resistor.
L19	1st Sound IF	10309S	17-1031		1461	
L20	2nd Sound IF	10309S	16-3465	TV-153a	6203a	
L21	Quadrature Coil	10310L	30-1026		1490	
L22	RF Choke					Note 1

Note 1: Not used in some versions.

* Parallel with 18K resistor.
a Parallel with 68K resistor.
@ Use adaptor plate.
Note 2: Not used in some versions.

TRANSFORMER (HORIZ. OSC.)

ITEM No	DC RES.		REPLACEMENT DATA						NOTES
	PRI.	SEC.	RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MULLER PART No.	RCA TYPE No	Ram PART No	Thordarson PART No	
L23	90Ω		10310S			6211			22S-7	Tapped @ 60Ω Horiz. Osc.
L24	43Ω		10310Z			6314			22S-6	Horiz. Waveform

FILTER CHOKE

ITEM No	RATINGS			REPLACEMENT DATA						
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE @ CURRENT	RCA Victor PART No.	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
L25	.250A	68.5Ω	.98HY @ 1000 ℃	10308S	C-2937 ①	C-2998 ①	C-2326 ①	28C44 ①	C-17X ①

① Drill one new mounting hole.

FUSES

ITEM No	TYPE	RATING	REPLACEMENT DATA					
			RCA Victor PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	C	3/10A 250V	10316A	10316B	332.300 (C-3/10A)	346001	C 3/10	HC 0 to 3/10

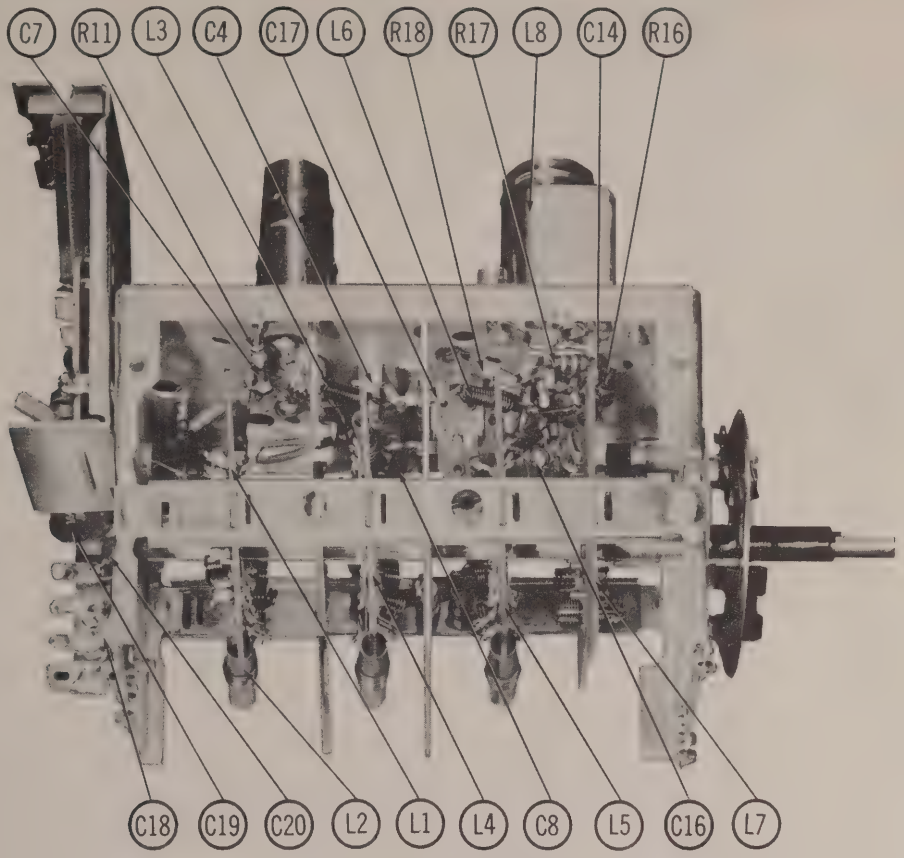
PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

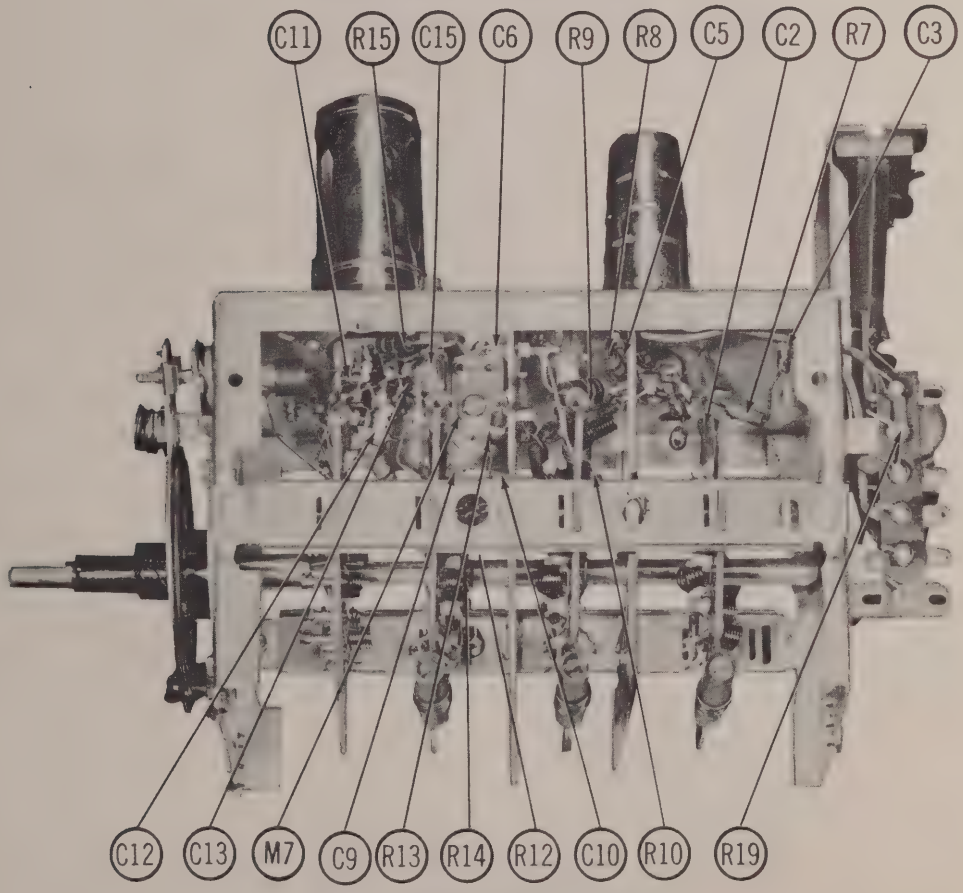
ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		RCA Victor PART No.	SYLVANIA PART No.	
M2	1N64	79985	1N60	Video Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M3	Tuner	KRK32-F	VHF, Used in Chassis KCS102B.
	Tuner	KRK29-W	VHF, Used in Chassis KCS102D.
	Tuner	KRK36-F	UHF, Used in Chassis KCS102D.
M4	Ant. Matching Network	100454	Includes Coils and Caps.
M5	Centering Device	103115	Includes Yoke Back Cover.
M6	Ion Trap	76141	
M7	Trimmer Cap.	79551	Mica (55-80MMF)
M8	Trimmer Cap.	100851	IF Link, Mica (5-70MMF)
	Switch	102844	UHF/VHF Ant. Selector, Used in Chassis KCS102D.
	Safety Glass	103082	
	Mask	103080	Includes Nameplate.
	Knob	103065	Fine Tuning, Black, Models 14-S-7052, U.
	Knob	103063	Fine Tuning, Red, Models 14-S-7070, U.
	Knob	103066	Fine Tuning, Gray, Models 14-S-7071, U.
	Knob	103064	Fine Tuning, Tan, Models 14-S-7074, U.
	Knob	103069	UHF Fine Tuning, Black, Models 14-S-7052U.
	Knob	103067	UHF Fine Tuning, Red, Models 14-S-7070U.
	Knob	103070	UHF Fine Tuning, Gray, Models 14-S-7071U.
	Knob	103068	UHF Fine Tuning, Tan, Models 14-S-7074U.
	Knob	103057	VHF Channel Selector, Black, Model 14-S-7052.
	Knob	103055	VHF Channel Selector, Red, Model 14-S-7070.
	Knob	103058	VHF Channel Selector, Gray, Model 14-S-7071.
	Knob	103056	VHF Channel Selector, Tan, Model 14-S-7074.
	Knob	103061	UHF/VHF Channel Selector, Black, Model 14-S-7052U.
	Knob	103059	UHF/VHF Channel Selector, Red, Model 14-S-7070U.
	Knob	103062	UHF/VHF Channel Selector, Gray, Model 14-S-7071U.
	Knob	103060	UHF/VHF Channel Selector, Tan, Model 14-S-7074U.
	Knob	103078	On-Off Volume, Brightness, Vert. & Contrast, Black, Models 14-S-7052, U.
	Knob	103076	On-Off Volume, Brightness, Vert. & Contrast, Red, Models 14-S-7070, U.
	Knob	103079	On-Off Volume, Brightness, Vert. & Contrast, Gray, Models 14-S-7071, U.
	Knob	103077	On-Off Volume, Brightness, Vert. & Contrast, Tan, Models 14-S-7074, U.
	Handle	103088	Bakelite, Black, Models 14-S-7052, U.
	Handle	103085	Leather, Red, Models 14-S-7070, U.
	Handle	103087	Leather, Gray, Models 14-S-7071, U.
	Handle	103086	Leather, Ivory, Models 14-S-7074, U.



RF TUNER-LEFT SIDE

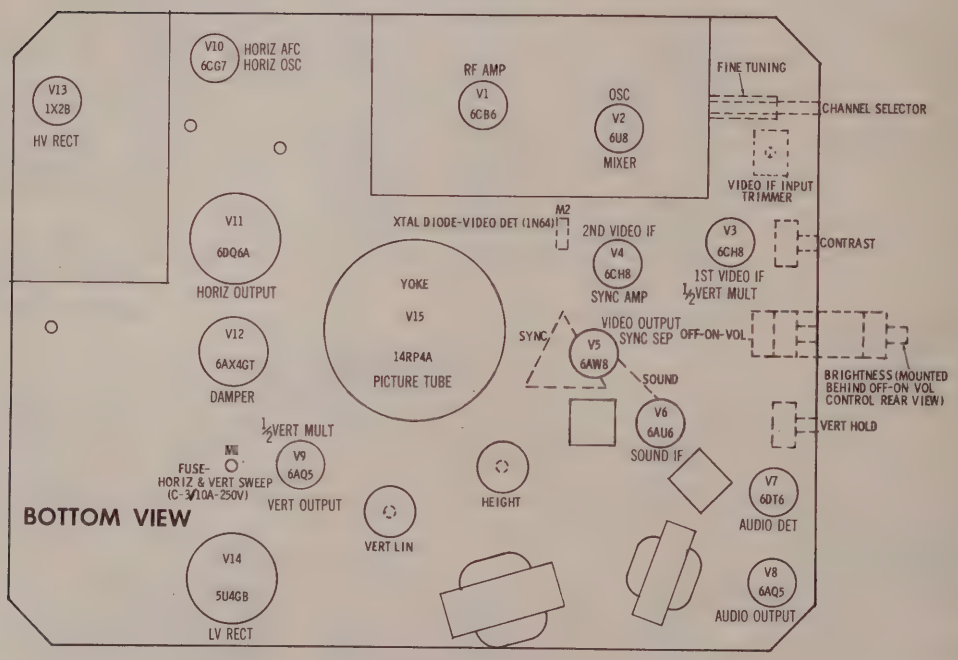


RF TUNER-RIGHT SIDE

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6	460K	47Ω	0Ω	.1Ω	†1500Ω	†30K	0Ω		
V2	6U8	†6000Ω	100K	INF	0Ω	.1Ω	INF	0Ω	INF	INF
V3	6CH8	0Ω	†7500Ω	†7500Ω	.1Ω	0Ω	27Ω	440K	•3.5Meg	•‡500K
V4	6CH8	0Ω	†8200Ω	†8200Ω	.1Ω	0Ω	180Ω	.3Ω	18K	†20K
V5	6AW8	0Ω	3.2Meg	†680K	.1Ω	0Ω	•50Ω	680K	†47K	†4200Ω
V6	6AU6	47K	0Ω	0Ω	.1Ω	†10K	†20K	82Ω		
V7	6DT6	4.1Ω	560Ω	0Ω	.1Ω	‡1Meg	†18K	470K		
V8	6AQ5	45K	680Ω	0Ω	.1Ω	†2500Ω	†2200Ω	45K		
V9	6AQ5	•1.7Meg	0Ω	0Ω	.1Ω	†600Ω	†200Ω	•1.7Meg		
V10	6CG7	†50Ω	1.3Meg	330K	.1Ω	0Ω	†39K	270K	0Ω	0Ω
V11	6DQ6A	NC	.1Ω	NC	†18K	1Meg	TP	0Ω	27Ω	TOP CAP ‡17.5Ω
V12	6AX4GT	NC	NC	1.8Meg	NC	†50Ω	NC	0Ω	.1Ω	
V13	1X2B	PINS 1 THRU 9 HAVE INFINITE RESISTANCE								TOP CAP ‡337.5Ω
V14	5U4GB	NC	25K	NC	46Ω	NC	42Ω	NC	25K	
V15	14RP4A	0Ω	22K	Pin 6 †50Ω	Pin 10 ‡340K	Pin 11 • 170K	Pin 12 .1Ω			

† MEASURED FROM PIN 8 OF V14.
‡ MEASURED FROM PIN 3 OF V12.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
NC NO CONNECTION
TP TIE POINT

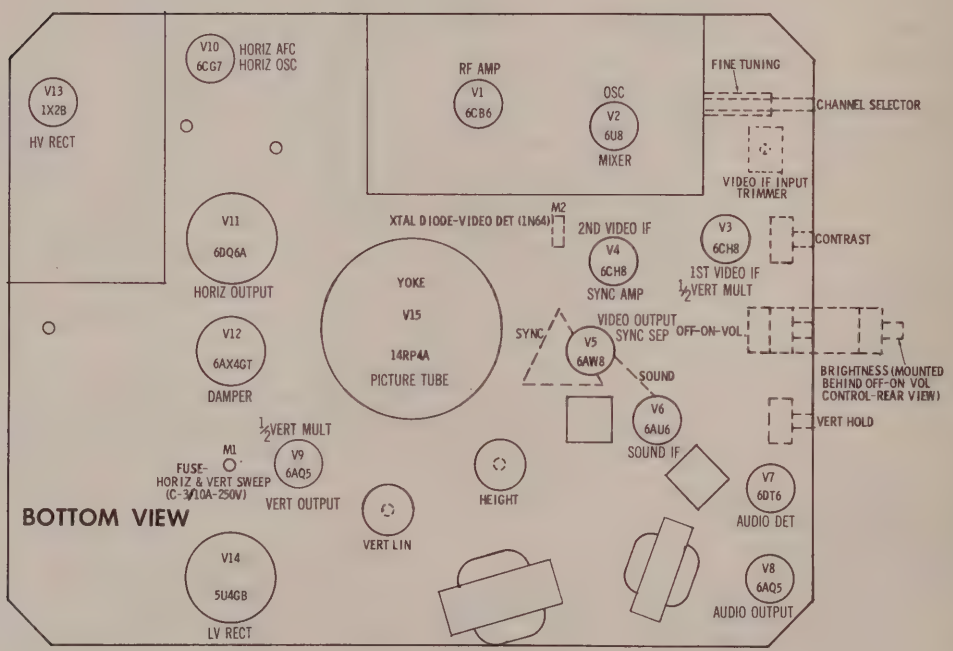


TUBE PLACEMENT CHART

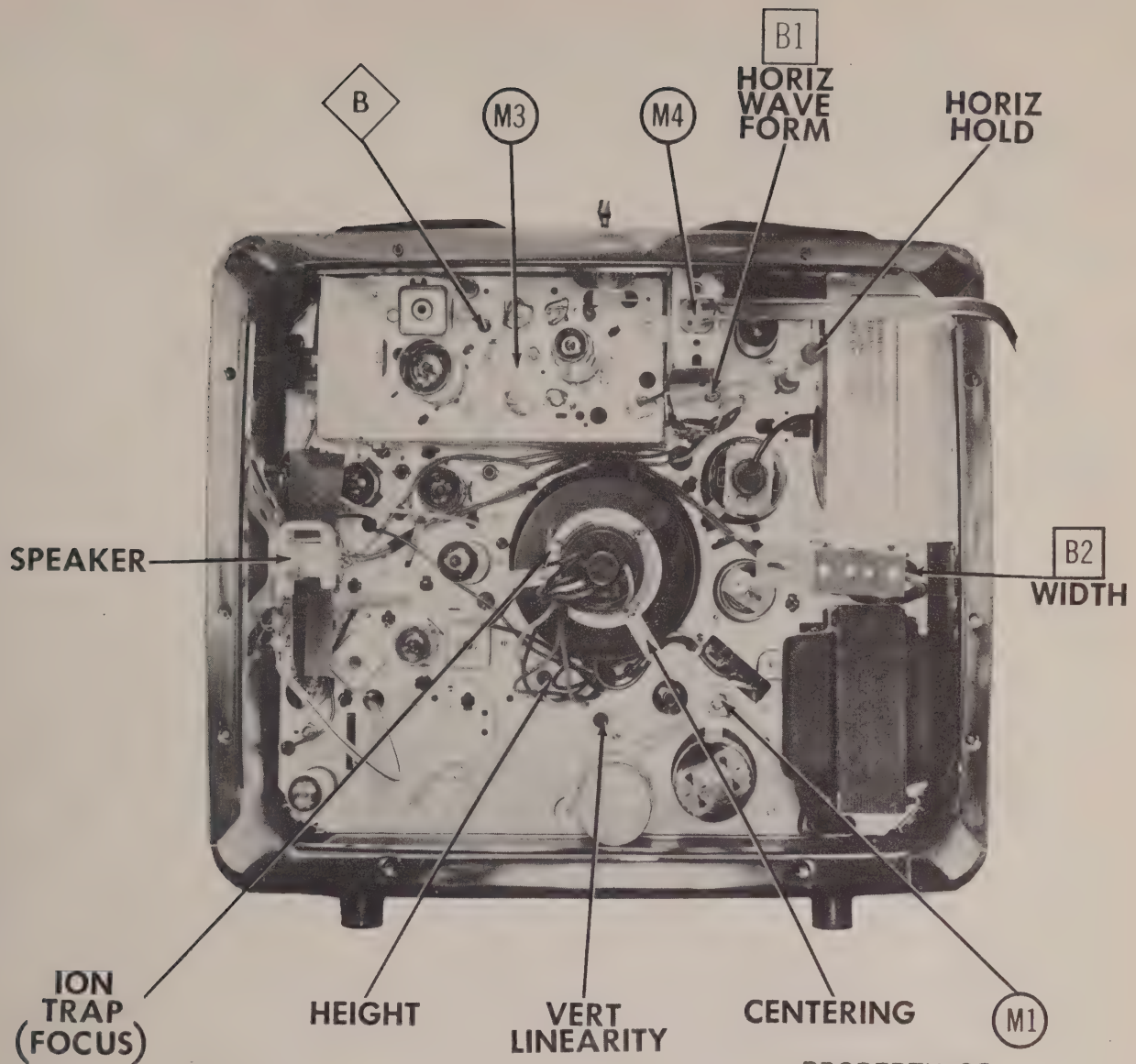
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6	460K	47Ω	0Ω	.1Ω	†1500Ω	†30K	0Ω		
V2	6U8	†6000Ω	100K	INF	0Ω	.1Ω	INF	0Ω	INF	INF
V3	6CH8	0Ω	†7500Ω	†7500Ω	.1Ω	0Ω	27Ω	440K	•3.5Meg	•‡500K
V4	6CH8	0Ω	†8200Ω	†8200Ω	.1Ω	0Ω	180Ω	.3Ω	18K	†20K
V5	6AW8	0Ω	3.2Meg	†680K	.1Ω	0Ω	•50Ω	680K	†47K	†4200Ω
V6	6AU6	47K	0Ω	0Ω	.1Ω	†10K	†20K	82Ω		
V7	6DT6	4.1Ω	560Ω	0Ω	.1Ω	‡1Meg	†18K	470K		
V8	6AQ5	45K	680Ω	0Ω	.1Ω	†2500Ω	†2200Ω	45K		
V9	6AQ5	•1.7Meg	0Ω	0Ω	.1Ω	†600Ω	†200Ω	•1.7Meg		
V10	6CG7	†50Ω	1.3Meg	330K	.1Ω	0Ω	†39K	270K	0Ω	0Ω
V11	6DQ6A	NC	.1Ω	NC	†18K	1Meg	TP	0Ω	27Ω	TOP CAP ‡17.5Ω
V12	6AX4GT	NC	NC	1.8Meg	NC	†50Ω	NC	0Ω	.1Ω	
V13	1X2B	PINS 1 THRU 9 HAVE INFINITE RESISTANCE								TOP CAP ‡337.5Ω
V14	5U4GB	NC	25K	NC	46Ω	NC	42Ω	NC	25K	
V15	14RP4A	0Ω	22K	Pin 6 †50Ω	Pin 10 ‡340K	Pin 11 • 170K	Pin 12 .1Ω			

† MEASURED FROM PIN 8 OF V14.
‡ MEASURED FROM PIN 3 OF V12.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART



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CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Connect a clip lead across the horizontal waveform coil (L24) and adjust the horizontal hold until the picture synchronizes horizontally. Remove the clip lead from across L24. Connect the vertical amplifier of the oscilloscope to point (E) thru a low capacity probe. Connect the low side to chassis. Turn the horizontal hold clockwise until the picture just falls out of sync, then counter clockwise until the picture just falls into sync. Adjust the horizontal waveform slug (B1) until the waveform on the scope appears similar to Fig. 8 with the round peak and the sharp peaks of equal amplitude. Adjust the width slug (B2) for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally.

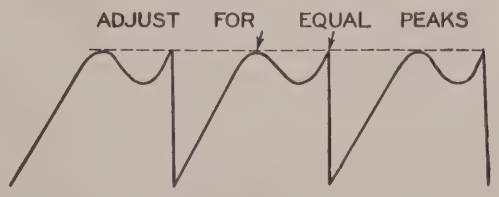

FIG. 8

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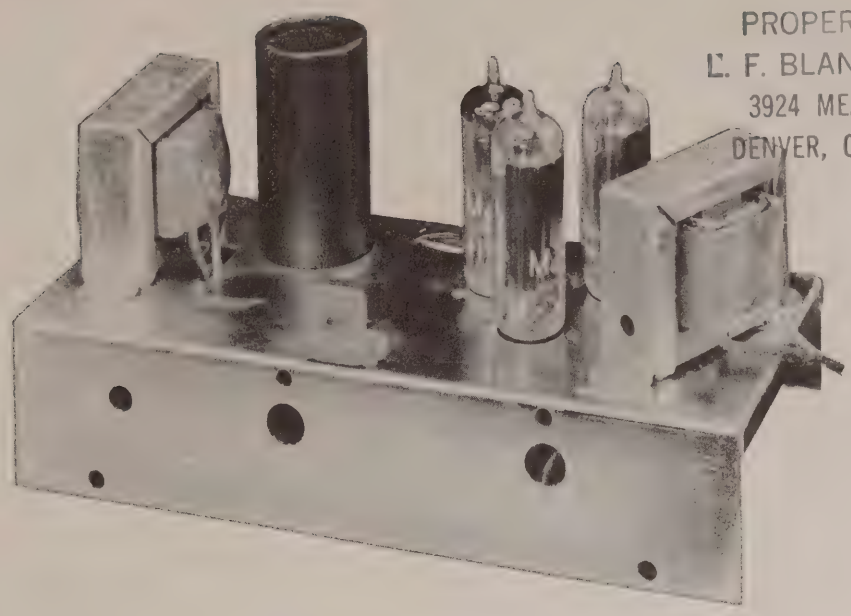
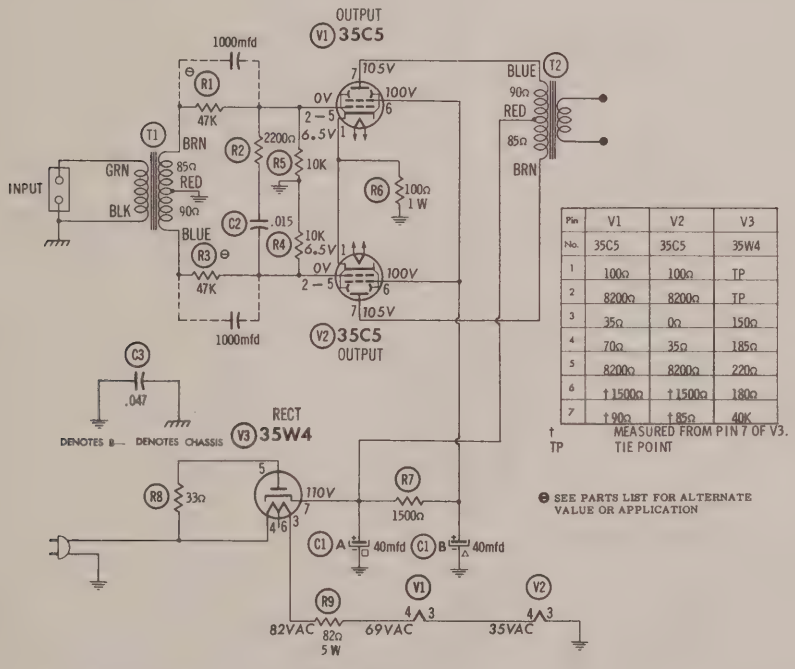
MAGNAVOX
CHASSIS AMP155AA



TRADE NAME	Magnavox Chassis AMP-155AA
MANUFACTURER	Magnavox Co., 2131 Bueter Rd., Fort Wayne, Indiana
TYPE SET	AC Operated Audio Amplifier
TUBES (Three)	Types (2) 35C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC - 50/60 Cycles RATING .29 Amp. @ 117 Volts AC



Pin No.	V1 35C5	V2 35C5	V3 35W4
1	100Ω	100Ω	TP
2	8200Ω	8200Ω	TP
3	35Ω	0Ω	150Ω
4	70Ω	35Ω	185Ω
5	8200Ω	8200Ω	220Ω
6	†1500Ω	†1500Ω	180Ω
7	†90Ω	†85Ω	40K

† TP MEASURED FROM PIN 7 OF V3. TIE POINT

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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354-11

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	35C5	
V2	Output	35C5	

ITEM No.	USE	TYPE	NOTES
V3	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■40	150	270023-26	AFH2-14	XBO141	FP212	TMD-11	D-060	TVL-2428
B	▲40	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.015	200	250202-8	BPD-015	DD16-153	CUB6S15		GEM-6115	6TM-S15	
C3	.047	600	250201-11	BPD-05	DF-503	CUB6S47		GEM-4147	6TM-S47	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MAGNAVOX PART No.	IRC PART No.	
R1	47K			BTS-47K	Note 1
R2	2200Ω		230104-66	BTS-2200	
R3	47K			BTS-47K	Note 1
R4	10K		230104-74	BTS-10K	
R5	10K		230104-74	BTS-10K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MAGNAVOX PART No.	IRC PART No.	
R6	100Ω	1	230105-50	BTA-100	
R7	1500Ω		230104-64	BTS-1500	
R8	33Ω		230104-44	BTS-33	
R9	82Ω	5	240071-24		

Note 1: 68K used in some versions. (Part #230104-84)

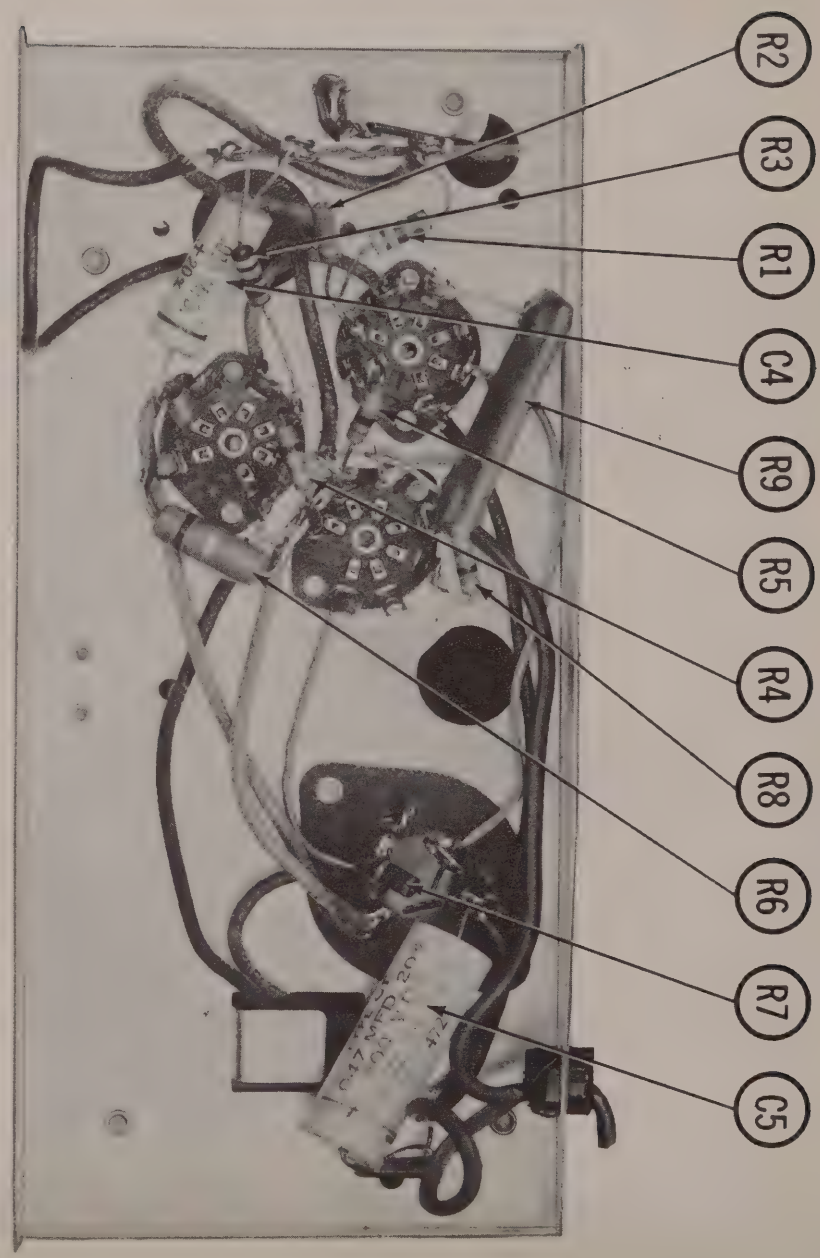
TRANSFORMER (INPUT)

ITEM No.	Turns Ratio		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1 : 35		320272-1	Z1002 ①	A-2901 ①	A-3823 ①		S-53X ①	① Use secondary taps 5 & 6 for primary winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	3850Ω CT	3-4Ω	320272-1	Z1002 ①	A-2901 ①	A-3823 ①		S-53X ①	① Use secondary taps 5 & 6.

CHASSIS—BOTTOM VIEW



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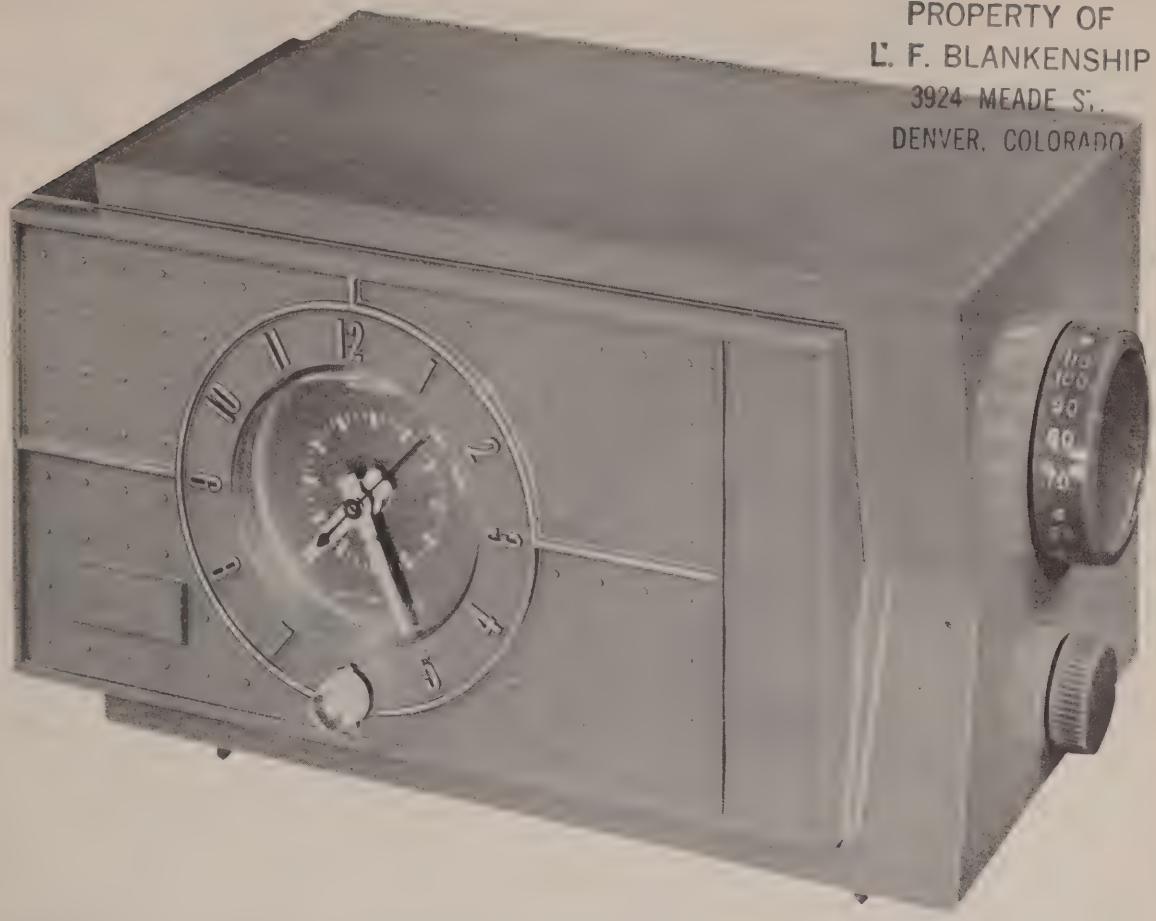
SONORA
MODELS 548, 552, 553, 561, 581



SONORA
MODELS 548, 552, 553, 561, 581

TRADE NAME	Sonora Models 548, 552, 553, 561, 581
MANUFACTURER	Sonora Radio & Tel. Corp., 325 N. Hoyne Ave., Chicago, Ill.
TYPE SET	AC Operated AM Receiver With Electric Clock
TUBES (Four)	Types 12AU6 Converter, 12AV6 Det.-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles
RATING	.26 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to antenna stator plates of tuning gang. Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A3	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12AU6	
V2	Det. -AF Amplifier	12AV6	
V3	Output	50C5	
V4	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SONORA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150	R-1482	PRS150/25V	BBRT4215C	TCT3114	TDLT-12	FMT-321	TVA-3423
B	20	150		4020/20					
C	20	15							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SONORA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	2. 2									
C3	100		N-6015	SI 100	D6-101	TP34	GP-100	UC-531	5GA-T1	
C4	56									
C5	56									
C6	10000		N-9062	BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C7	10000		N-9062	BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C8	.047	200	R-1462	BPD-05	DF-503	CUB2S47		GEM-4147	4TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SONORA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2Meg	½	R1816I	AB-76	A47-2Meg-Z	Q13-139	U55	Volume
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	

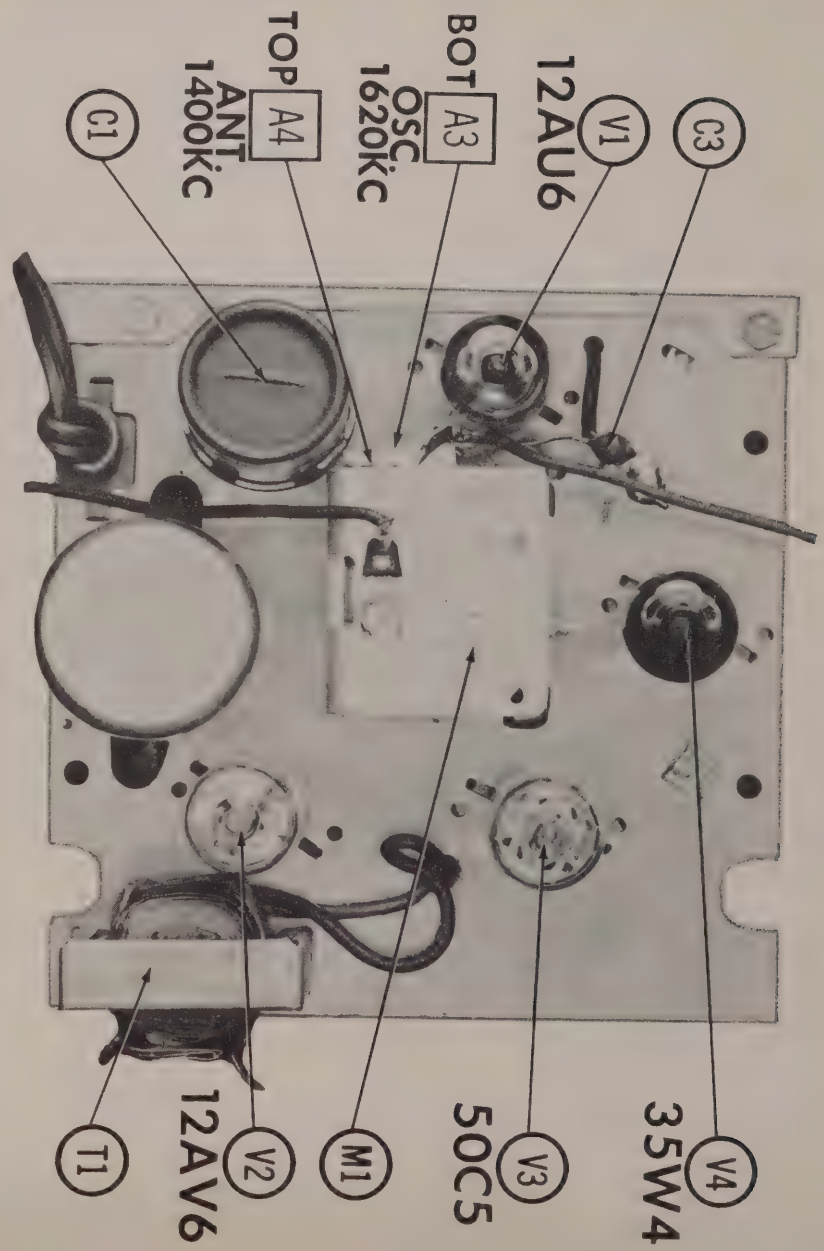
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SONORA PART No.	IRC PART No.	
R2	2. 7Meg			BTS-2. 7Meg	
R3	180Ω			BTS-180	
R4	2200Ω			BTS-2200	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SONORA PART No.	IRC PART No.	
R5	68Ω	2	R-1483		
R6	22Ω			BTS-22	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SONORA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2700Ω	3-4Ω	R-1841	Z1101 ①	A-3025 ①	A-3332 ①	26S58 ①	S-12X ①	① Use original channel

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SONORA PART No.	QUAM PART No.		
SP1	3½"	PM	3-4Ω	R-1863	3A07		

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SONORA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	2.4Ω		R-1864				
L2	Osc. Coil	1Ω	7.8Ω	R-2116				Tertiary winding-1.9Ω
L3	IF Trans.	26Ω *	26Ω	R-1898				* Tapped @ 1Ω

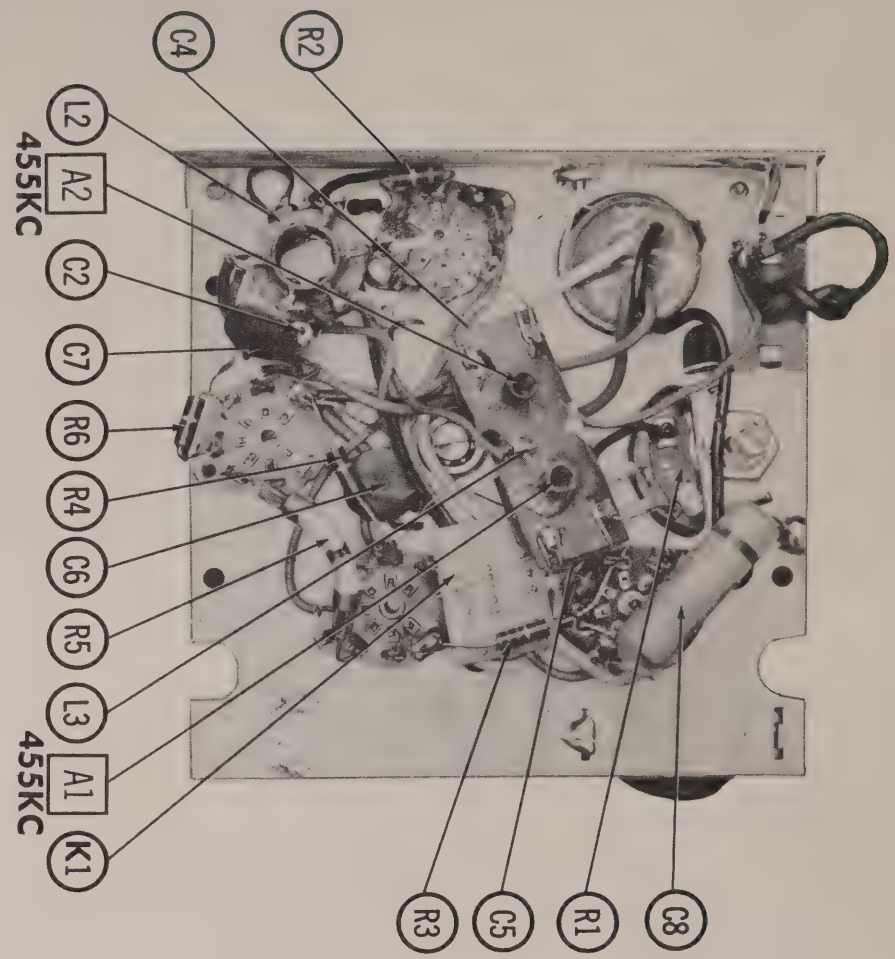
COMPONENT COMBINATIONS

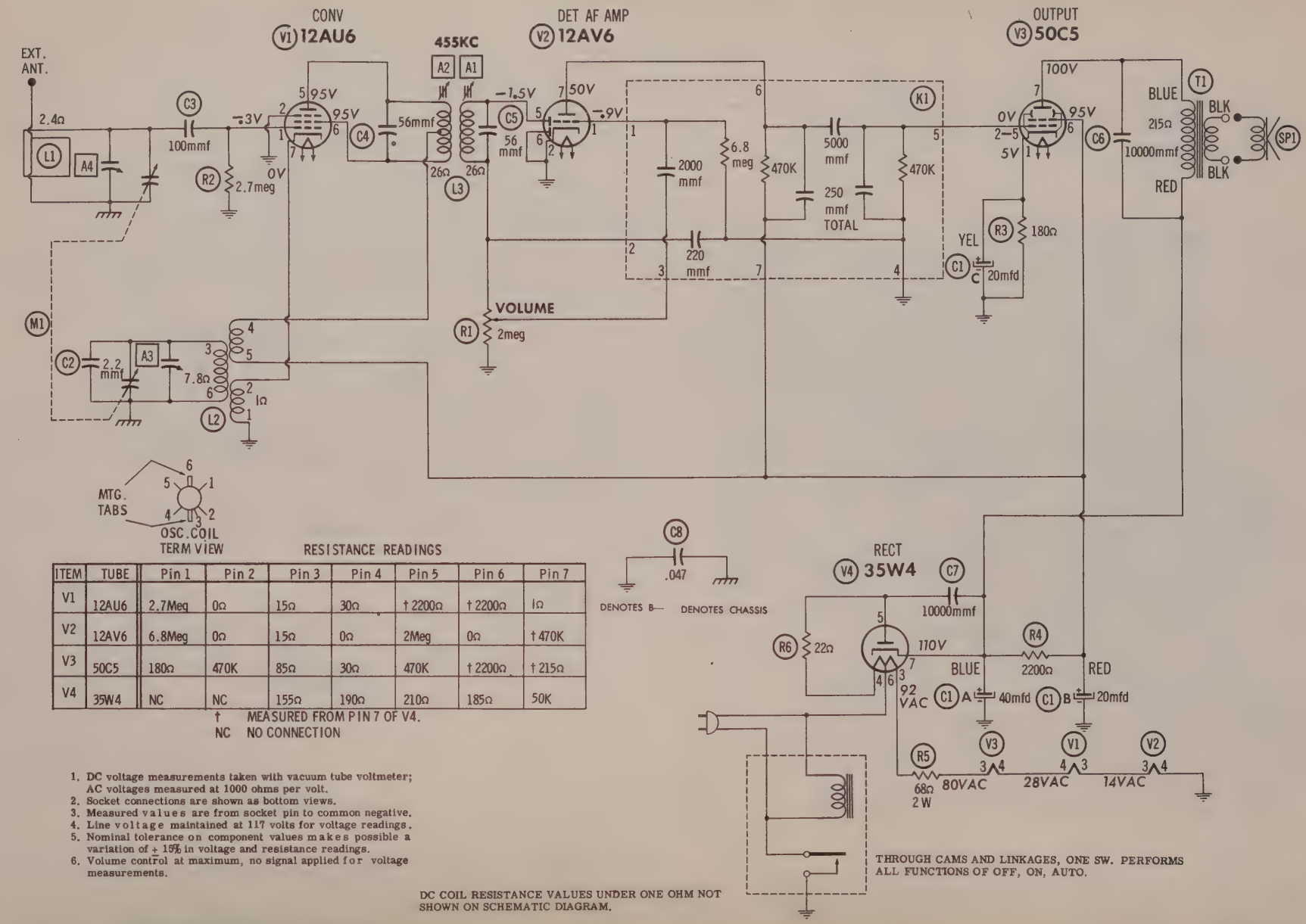
ITEM No.	USE	DESCRIPTION	SONORA PART No.	REPLACEMENT DATA	
K1	Detector-Audio Circuit	5000MMF, 2000MMF, 250MMF, 220MMF, 6.8Meg, 470K, 470K	R-1487	Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-113-1 PC-150 116TM1 1408-01 DT-1

MISCELLANEOUS

ITEM No.	PART NAME	SONORA PART No.	NOTES
M1	Tuning Cap.	R-1481	2 Gang (21-290MMF, 12-115MMF)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AU6	2.7Meg	0Ω	15Ω	30Ω	†2200Ω	†2200Ω	1Ω
V2	12AV6	6.8Meg	0Ω	15Ω	0Ω	2Meg	0Ω	†470K
V3	50C5	180Ω	470K	85Ω	30Ω	470K	†2200Ω	†215Ω
V4	35W4	NC	NC	155Ω	190Ω	210Ω	185Ω	50K

† MEASURED FROM PIN 7 OF V4.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

THROUGH CAMS AND LINKAGES, ONE SW. PERFORMS ALL FUNCTIONS OF OFF, ON, AUTO.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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RETMA MEMBER

TRUETONE MODELS 2D3775A, B

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TRUETONE MODEL 2D3775B

TRADE NAME	Truetone, Models 2D3775A, B
SUPPLIER	Western Auto Supply Co., 2107 Grand Avenue, Kansas City, Mo.
TYPE SET	Television Receiver
TUBES	Thirteen
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING - 115 Watts, 1.14 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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TRUETONE MODELS 2D3775A, B

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type control knobs.
2. Remove 6 metal screws, 2 antenna leads and rear cover.
3. Remove picture tube socket, Ion trap, HV lead and 2 speaker leads.
4. Remove 2 metal screws holding speaker and remove speaker.
5. Remove 2 metal screws holding AC interlock bracket.
6. Remove 2 chassis bolts from bottom.
7. Remove 1 top chassis bolt (middle one in handle).
8. Remove chassis.

MODEL

2D3775B

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS

Care should be exercised when connecting test equipment or physcially contacting chassis.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs. The HIGH band adjustments may be made with the slug located near the right side, the LOW band by slug near the bottom of the tuner. Adjust from highest to lowest channel.

PICTURE TUBE SAFETY GLASS CLEANING

1. Remove the front handle mounting screw.
2. Remove 2 metal screws on the bottom, holding the front.
3. Remove the front of the cabinet.
4. Remove the clamps holding the safety glass and remove the glass.

FOCUS

Focus may be varied by placement of a strap on the picture tube base between pins 6 and 2 or 6 and 10. Readjust Ion trap for best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

To adjust the horizontal oscillator, remove the rear cover and supply power to the set. Set the horizontal hold control at mid-position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

FUSES

A 4.7Ω fusible resistor (R68) is used for LV power supply protection.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

TRUETONE MODELS
2D3775A, B

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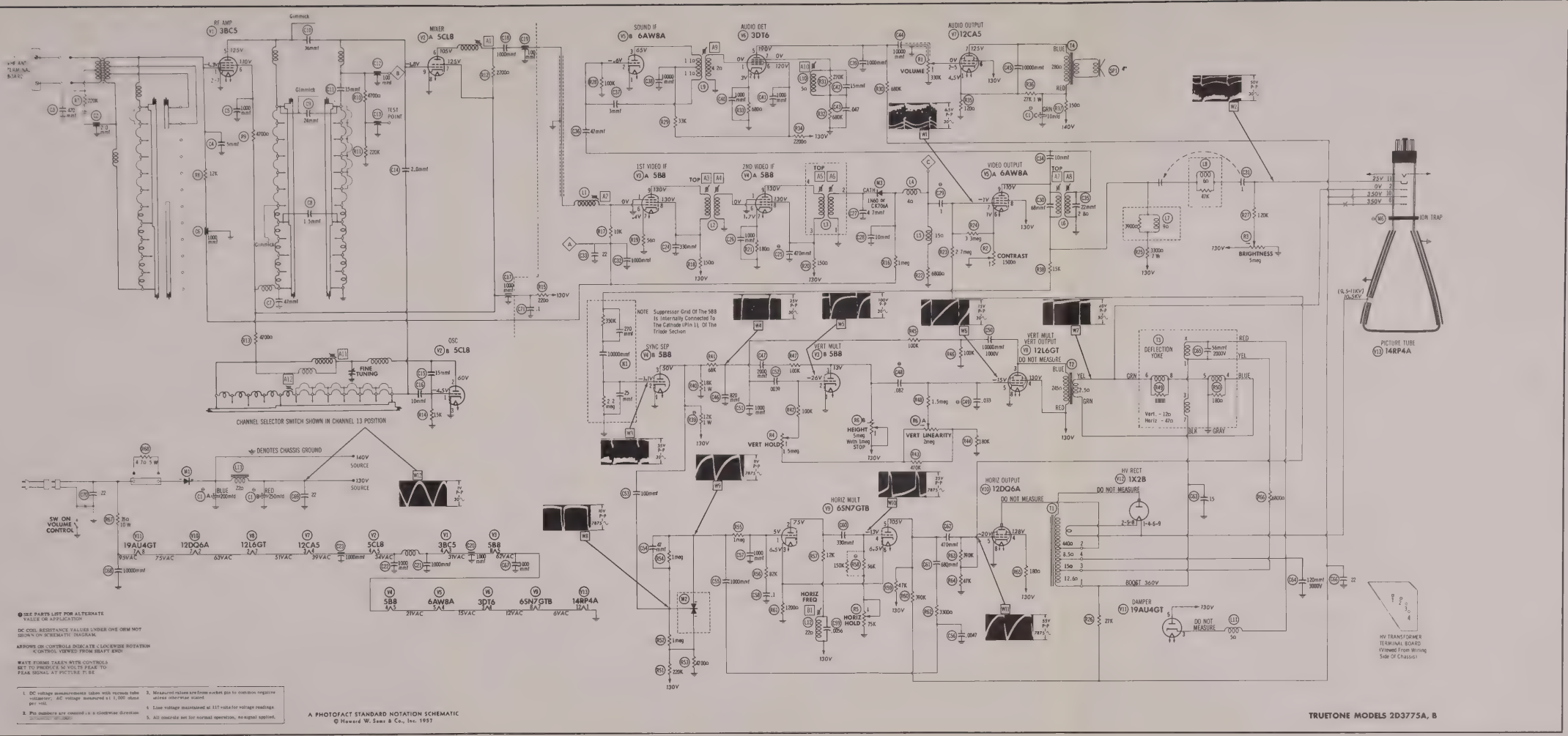

SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted as a clockwise direction.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.

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TRUETONE MODELS 2D3775A, B

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TUBE PLACEMENT CHART

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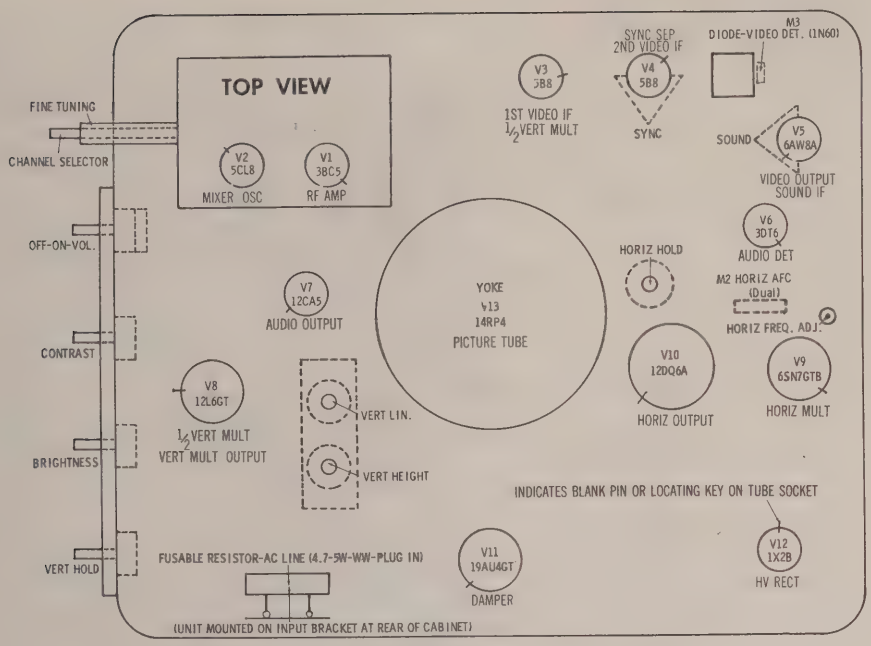


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

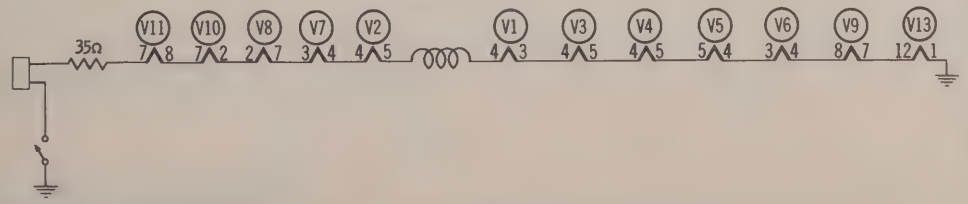
POWER SUPPLY FAILURE
No raster, no sound - **Fusible Resistor (R68), Rectifier (M1)**

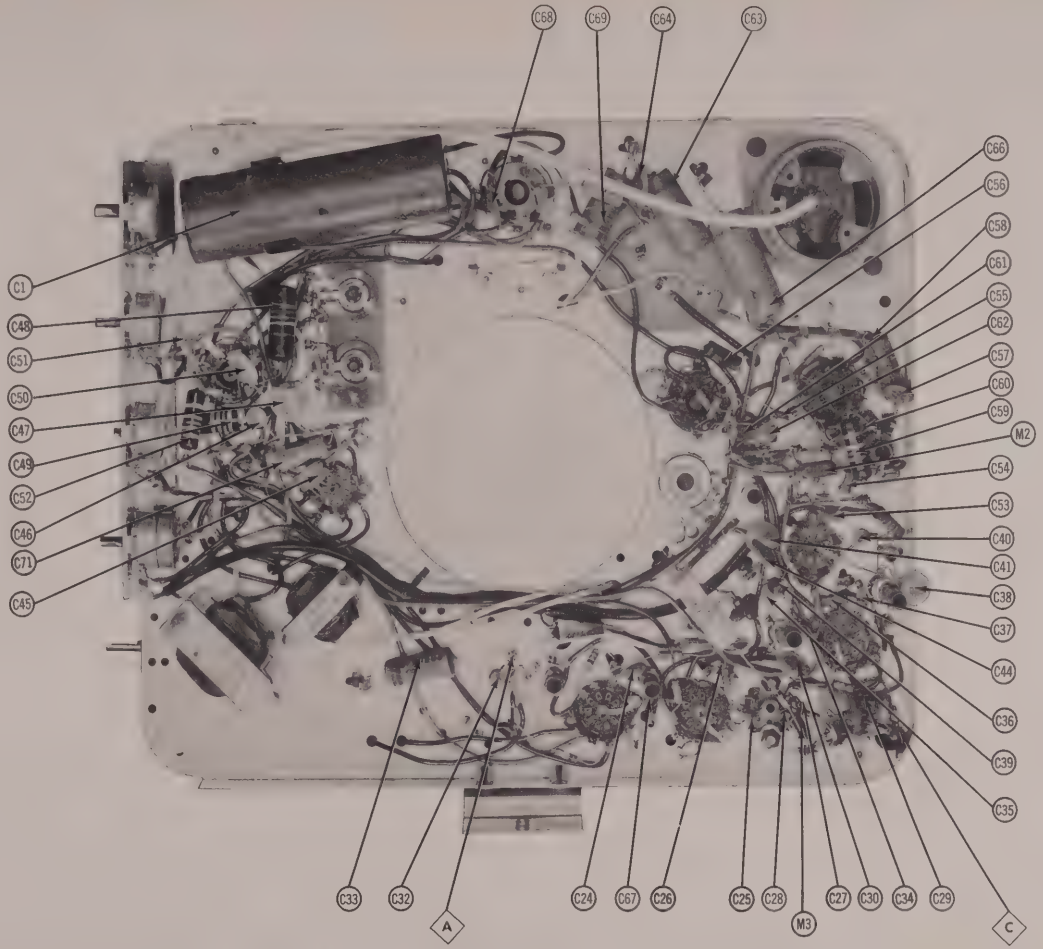
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, Diode (M3), V5**
No pic, no sound, has snow - **V1, V2**
No pic, has sound, has raster - **V5, V13**
Has pic, no sound - **V5, V6, V7**

SYNC FAILURE
No vert. sync - **V3, V4, V8**
No horiz. sync - **V4, Diode (M2), V9**
No vert. or horiz. sync - **V4**

SWEEP FAILURE
No raster, has sound - **M2, V9, V10, V11, V12, V13**
No vertical deflection - **V3, V8**
Poor vert. linearity or foldover - **V3, V8**
Poor horiz. linearity or foldover - **V9, V10, V11**
Narrow picture - **V9, V10, V11, M1**
Vert. off freq. - **V3, V4, V8**
Horiz. off freq. - **V4, M2, V9**

Since this receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below.)





CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

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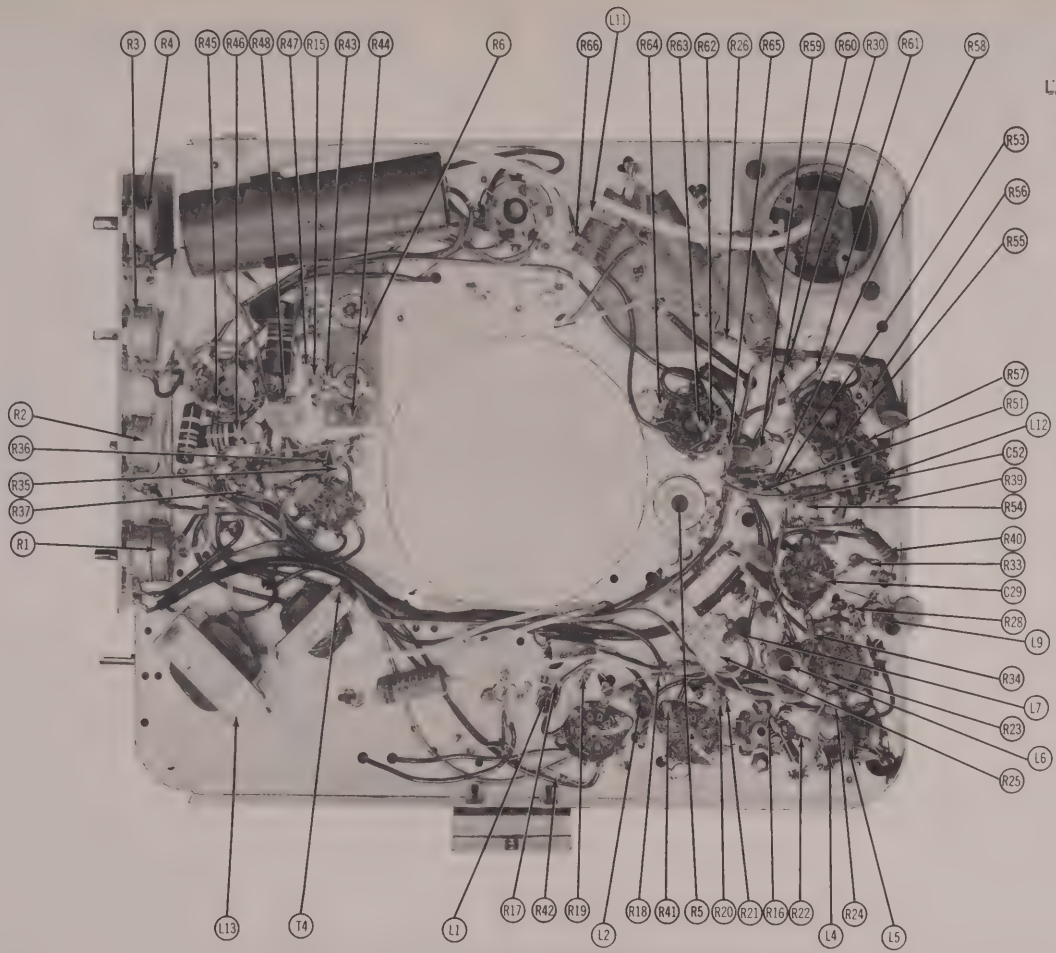


CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias battery to point Ⓐ. Positive to chassis.
Disable oscillator by replacing Mixer-Osc. tube 5CL8 (V2) with a 5CL8 with pin 1 removed.
Short the antenna terminals.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	1000MMF ceramic capacitor	High side to point Ⓑ. Low side to chassis.	44.0MC (10MC Swp)	42.75MC 45.75MC	Any channel.	Vert. amp. thru detector (Fig. 1) to plate, pin 9 of 5B8 (V3). Low side to chassis.	A1, A2	Adjust for response similar to Fig. 2 with markers in proper positions.
2.	"	High side to pin 6 (grid) of 5B8 (V3). Low side to chassis.	"	"	"	Vert. amp. thru detector (Fig. 1) to plate, pin 9 of 5B8 (V4). Low side to chassis.	A3, A4	"
3.	"	High side to pin 6 (grid) of 5B8 (V4). Low side to chassis.	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A5, A6	"
4.	"	High side to point B. Low side to chassis.	"	"	"	"		Retouch A1 thru A6 as needed to correct for curve similar to Fig. 3. Remove bias and replace 5CL8 (V2).

SOUND IF ALIGNMENT

Set the contrast control fully clockwise. Set volume control at midrange.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	1000MMF ceramic capacitor	High side to point Ⓒ. Low side to chassis.	Not used.	4.5MC (400∿ 30% AM Mod)	Any non-interfering channel.	Vert. amp. thru detector (Fig. 4) to pin 11 (cathode) of picture tube. Low side to chassis.	A7, A8	Turn A7 fully counter clockwise. Turn A8 fully clockwise. Turn A7 clockwise for MINIMUM 400∿ indication on scope.
6.	"	"	4.5MC (15KC Swp)	Not used.	"	Across secondary of output transformer.	A8, A9, A10	Use only enough sweep generator output to provide usable pattern on scope. Turn A10 fully counter clockwise. Adjust A8, A9 and A10 for maximum indication on scope. Remove test equipment and tune in a TV station. Retouch A10 for MINIMUM buzz.

OSCILLATOR ALIGNMENT

Turn the set on and tune in the highest high band channel (7-13) operating in the area and adjust A11 for clearest picture and best sound. A11 is located below and to the right of the tuning shaft. Switch the channel selector to the highest low band channel (2-6) operating in the area and adjust A12 for clearest sound and best picture. A12 is located directly to the left of the tuner shaft.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

FIG. 1

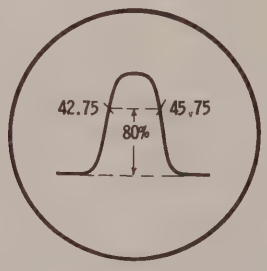


FIG. 2

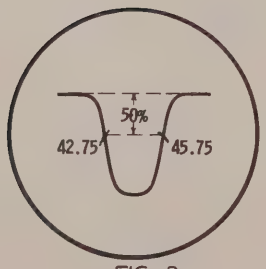


FIG. 3

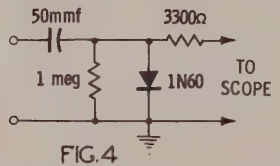
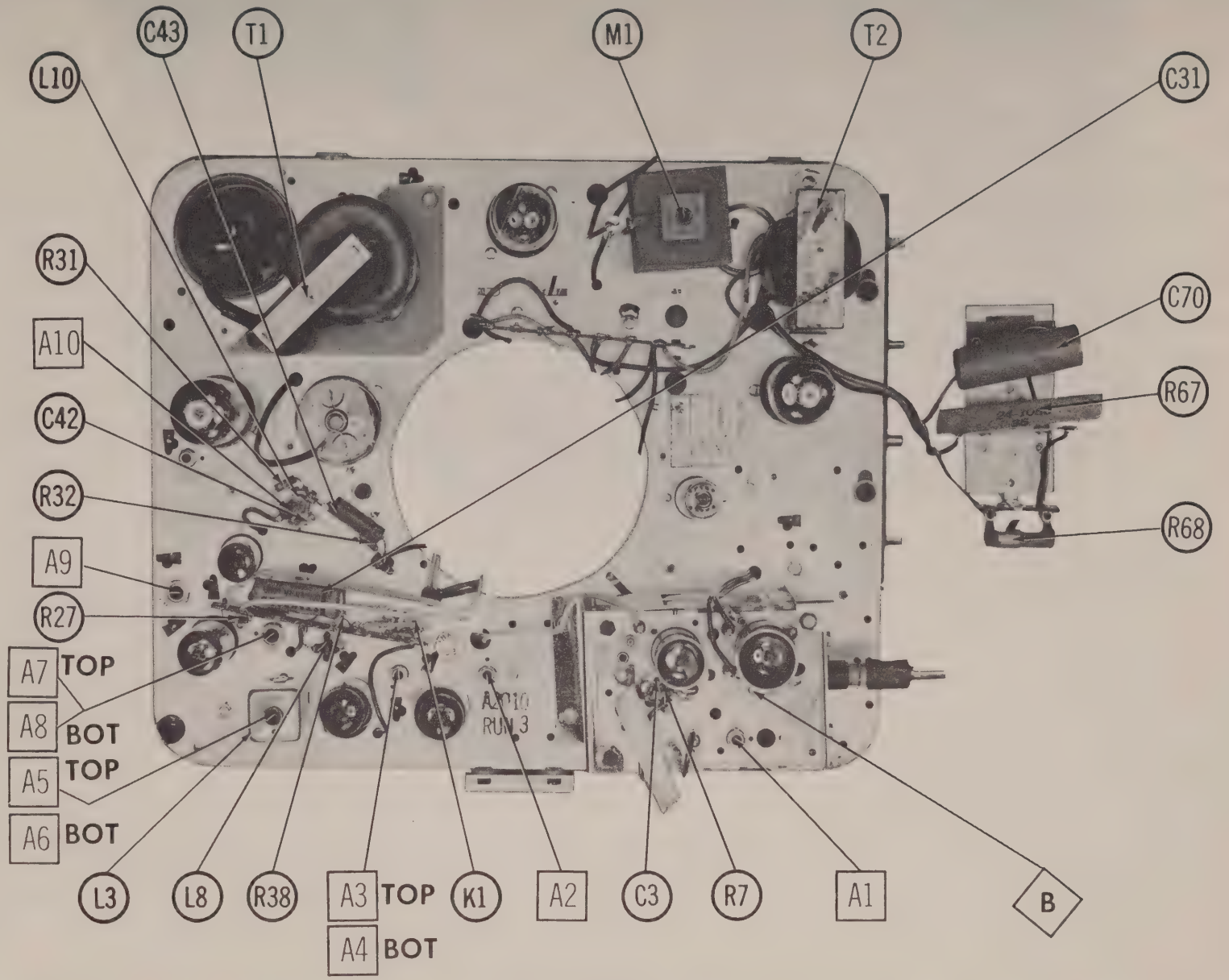


FIG. 4



CHASSIS TOP VIEW

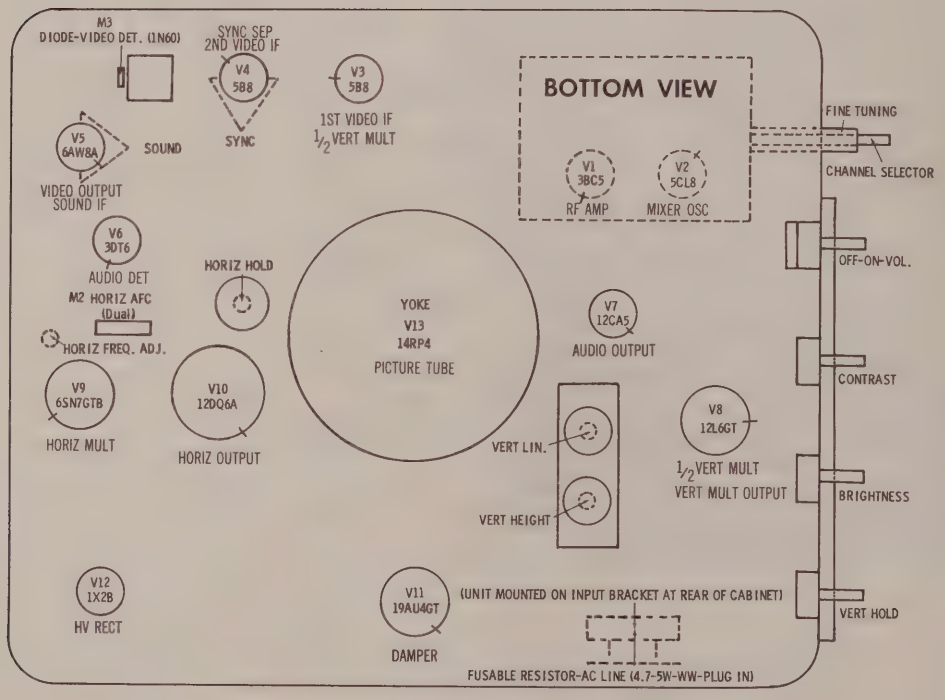
2D377SA, B

TRUETONE MODELS

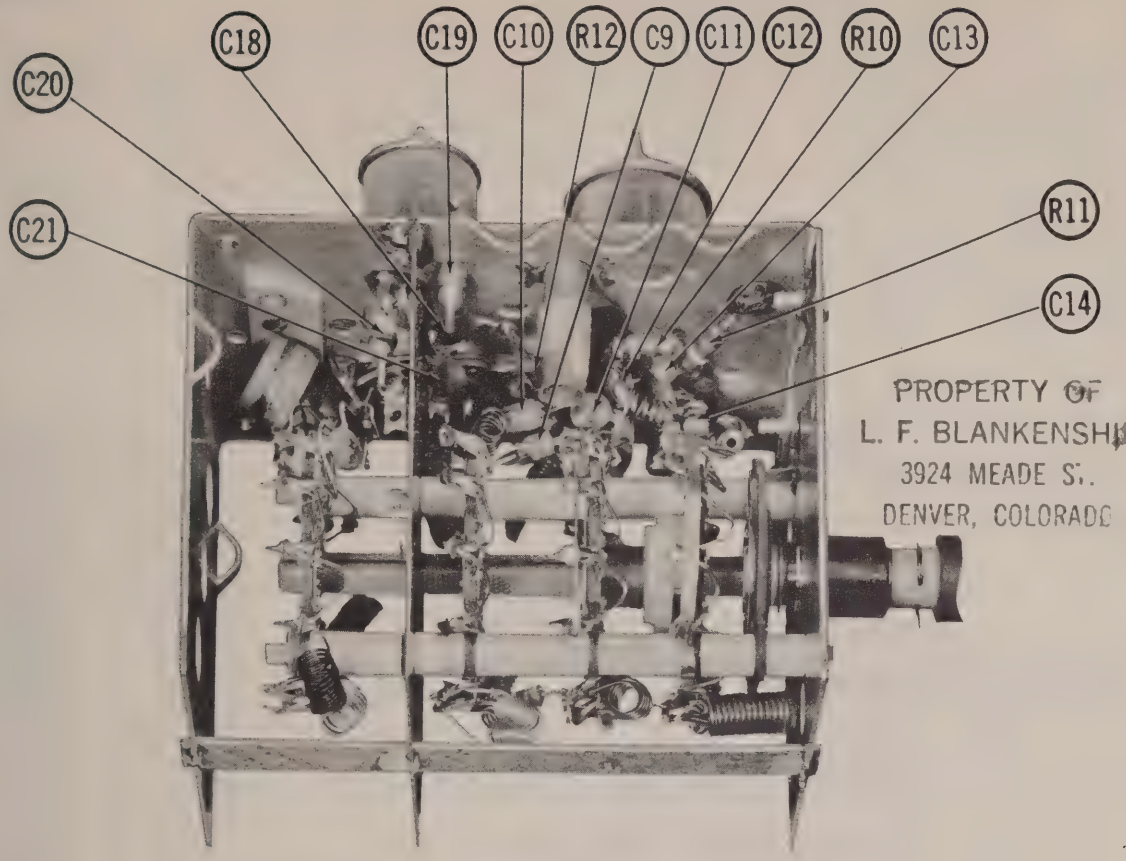
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BC5	1Meg	0Ω	6.5Ω	7Ω	†240Ω	†5000Ω	0Ω		
V2	5CL8	15K	†5000Ω	0Ω	7.5Ω	7Ω	†2400Ω	†240Ω	0Ω	220K
V3	5B8	0Ω	■1.3Meg	●†2.7Meg	6.5Ω	6.5Ω	1Meg	56Ω	†170Ω	†170Ω
V4	5B8	0Ω	2.2Meg	†12K	5.5Ω	5Ω	0Ω	180Ω	†170Ω	†170Ω
V5	6AW8A	0Ω	100K	†35K	3.5Ω	5Ω	● 10Ω	1.4Meg	†22Ω	†3300Ω
V6	3DT6	4.2Ω	680Ω	†3.5Ω	3Ω	‡700K	†2200Ω	680K		
V7	12CA5	120Ω	270K	9Ω	7.5Ω	270K	†22Ω	†430Ω		
V8	12L6GTB	TP	10.5Ω	†260Ω	†22Ω	●2.3Meg	TP	9Ω	0Ω	
V9	6SN7GTB	1.8Meg	†12K	1200Ω	●75K	†47K	1200Ω	1.5Ω	3Ω	
V10	12DQ6A	TP	10.5Ω	TP	†200Ω	440K	TP	11.5Ω	0Ω	TOP CAP ‡13Ω
V11	19AU4GT	NC	TP	480K	NC	†22Ω	TP	13Ω	11.5Ω	
V12	1X2B		PINS	1 THRU 9	HAVE	INFINITE	RESISTANCE			TOP CAP ‡453Ω
V13	14RP4	0Ω	3Ω	Pin 6 ‡27K	Pin 10 ‡27K	Pin 11 ●†120K	Pin 12 1.5Ω			

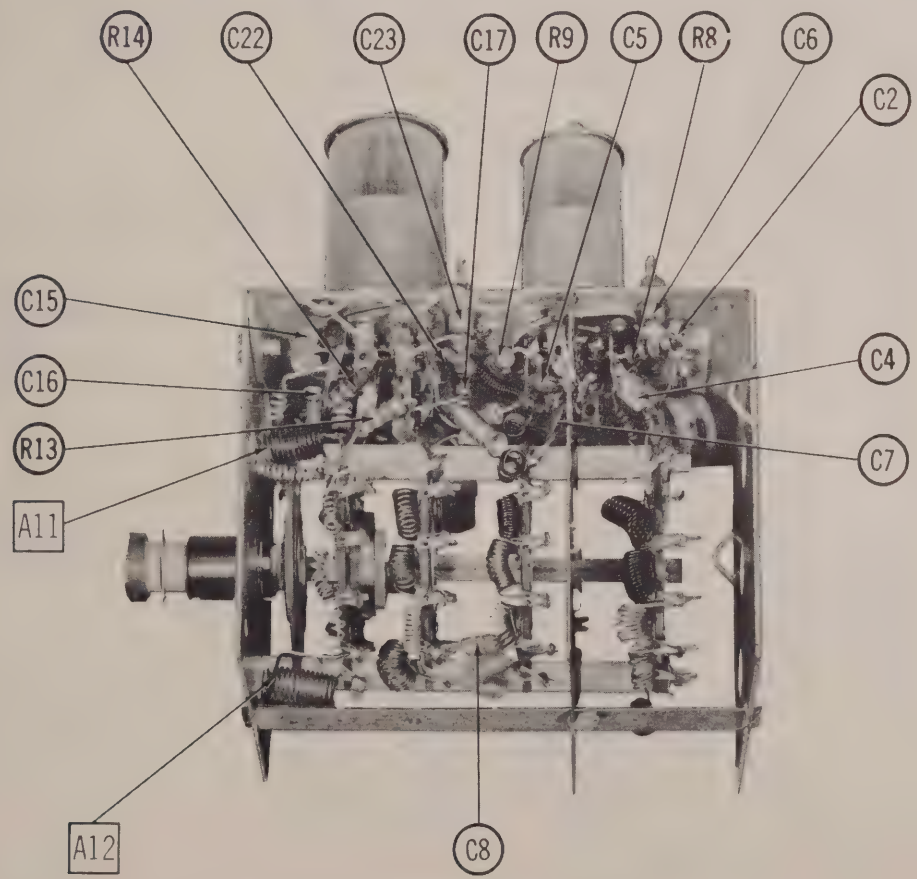
† MEASURED FROM OUTPUT OF M1.
‡ MEASURED FROM PIN 3 OF V11.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART



RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amp.	3BC5	
V2	Mixer-Osc.	5C10	
V3	1st Video IF, Vert. Multi.	5B8	
V4	2nd Video IF, Sync Sep.	5B8	
V5	Video Output-Sound IF	6AW8A	
V6	Audio Det.	3DT6	
V7	Audio Output	12CA5	
V8	Vert. Multi., Vert. Output	12LG7	
V9	Horiz. Mult.	6BQ7GTB	
V10	Horiz. Output	13DQ6A	
V11	Damper	18AU4GT	
V12	HV Rectifier	1X2B	

PICTURE TUBE

ITEM No	TRUETONE PART No.	REPLACEMENT DATA: GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V13	19RP4A	19RP4 ① 19RP4	19RP4A ②	① Aluminized ② Silver Screen "88"

ELECTOLYTIC CAPACITORS

ITEM No	RATING: CAP	RATING: VOLT	TRUETONE PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	REPLACEMENT DATA: MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	200	150	45A392 Note 1	PR3-012		WT320	CDBT 1015	D-095 MT-1510	R2294*
B	250	150							
C	10	50							

Note - Alternate part #45A394.
* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING: CAP	RATING: VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	2	0								
C3	47		47A636	BPD-00047	DD-471	BYA101747	ED-470	UC-5347	5GA-T47	
C4	5			NPO-41.5	TCZ-4R7	C10V5C	TCO-5	ST-5547	5TCCB-V5	
C5	1000		47-503	BPD-001	DD-102	BYA5D1	ED-1000	DC52	5HK-D1	
C6	1000			X7-001	MFT-1..300				503C-D1	
C7	47		47CA30A470M	BPD-000047	DD-470	L10Q47	ED-47	UC-5647	5GA-Q47	
C8	1.5			NPO-61.5	TCZ-1R5	C1HV15C	TCO-1.5	ST-5615	5TCCB-V15	
C9	24									
C10	36									
C11	15	1		BPD-000015	DD-150	L10Q15	ED-15	UC-5615	5GA-Q15	
C12										
C13	100			NPO-61 2.2	TCZ-1.2	C10V2C	TCO-1			
C14	2.2									
C15	15									
C16	10			NPO-5E10	TCZ-10	C10Q5C	TCO-10	ST-561	5TCC-Q1	N1000
C17	1000			X7-001	MFT-1..000				503C-D1	
C18	1300		47-503	BPD-001	DD-102	BYA5D1	ED-1000	DC52	5HK-D1	
C19	100									
C20	1000			X7-001	MFT-1..000				503C-D1	
C21	1000		47-503	BPD-001	DD-102	BYA5D1	ED-1000	DC52	5HK-D1	
C22	1000		47-503	BPD-001	DD-102	BYA5D1	ED-1000	DC52	5HK-D1	
C23	1000			X7-001	MFT-1..000				503C-D1	
C24	330		47A641	BPD-00033	DD-331	C10T33	ED-330	UC-5333	5GA-T33	
C25	470		47A643	BPD-00047	DD-471	BYA101747	ED-470	UC-5347	5GA-T47	
C26	1000		47A330	BPD-001	DD-102	BYA5D1	ED-1000	DC52	5HK-D1	Note 2
C27	4.7		47B403-6	NPO-61 4.7	TCZ-4R7	C10V47C	TCO-4.7	ST-555	5TCCB-V47	
C28	10		47CA20A100K	SI 10	D6-100	LT6Q	GP-10	UC-561	5GA-Q1	
C29	1	150		BPD-001-1	DF-104	CUB25F1		GEM-3121	5TM-P1	Note 3 NTS
C30	68		47-635							
C31	1	200	45D616-104M2	P268N-1	DF-104	CUB25F1		GEM-301	5TM-P1	
C32	1000		47A230	BPD-001	DD-102	BYA5D1	ED-1000	DC52	5HK-D1	
C33	82	100	45D616-224M1	P268N-22		CUB25F22		GEM-3222	5TM-P22	
C34	10		47A150 11	SI 10	D6-100	LT6Q	GP-10	UC-561	5GA-Q1	
C35	22		47-634							NTS
C36	47		47CA30A470M	SI 47	D6-470	LT6Q47	GP-47	UC-5447	5GA-Q47	
C37	3		47A307	SI 3	D6-030	LT8V3	TCO-3	ZT-563		
C38	10000		47A224	BPD-01	DD-103	BYA5E1	ED-01	DC51	5HK-E1	
C39	1000		47A230	BPD-001	DD-102	BYA5D1	ED-1000	DC52	5HK-D1	
C40	1000		47A230	BPD-001	DD-102	BYA5D1	ED-1000	DC52	5HK-D1	
C41	1000		47A230	BPD-001	DD-102	BYA5D1	ED-1000	DC52	5HK-D1	
C42	15		47B480							M080
C43	.047	200	45D616-473M2	BPD-05	DF-503	CUB254?		GEM-3147	5TM-S47	
C44	10000		47A224	BPD-01	DD-103	BYA5E1	ED-01	DC51	5HK-E1	
C45	10000		47A224	BPD-01	DD-103	BYA5E1	ED-01	DC51	5HK-E1	
C46	820		47-606	BPD-0000	D6-821	L10T82	ED-820		5GA-T82	
C47	2700		47A395	BPD-002	DD-302	BYA10D1	ED-003	DC533	5HK-D3	
C48	.003	200		P268N 033	DF-303	CUB2533		GEM-4133	5TM-S33	Note 4
C49	.033	200		P268N-03	DF-303	BYA333M			10EB-S-S1	Note 4
C50	10000	100	47-605	P268N-01	DD-103	BYA5E1	ED-001	DC531	5HK-E1	
C51	1000		47-503	BPD-001	DD-102	BYA5D1	ED-1000	DC52	5HK-D1	
C52	.0039	200	45E393E4	BPD-004	DE-402	CUB2D39	GP-4000	GEM-4134	5TM-D4	
C53	100		47CA20A10.M	SI 100	D6-101	LT6T	GP-100	UC-531	5GA-T1	
C54	47		47CA20A470M	SI 47	D6-470	LT6Q47	GP-47	UC-5447	5GA-Q47	
C55	1000		47A549	BPD-001	DD-102	BYA5D1	ED-1000	DC52	5HK-D1	
C56	.0047	200	45D616 473K2	BPD-0047	DE-472	CUB2D47	GP-4700	GEM-4247	5TM-D47	
C57	1000		47A549	BPD-001	DD-102	BYA5D1	ED-1000	DC52	5HK-D1	
C58	1	200	45D619 104M2	P268N-1	DF-104	CUB2F1		GEM-301	5TM-P1	
C59	.0056	400	45E0182E4	P468N-005	D6-562	CUB4D6	GP-5600	GEM-425	5TM-D56	
C60	330		47X20D33L	1464-00033		SWS732			M0-333	
C61	680		47X20D68L	1464-00068		IWS768			M0-347	
C62	470		47A638	BPD-00047	DD-471	BYA101747	ED-470	UC-5347	5GA-T47	
C63	15	600	45D616-154M5	P688N-15		CUB5F15		GEM-6015	5TM-P15	
C64	120	3000	47-640							
C65	56	1000	47A637							
C66	22	600		P68EN-22		CUB6F22		GEM-6022	5TM-P22	
C67	1000		47A230	BPD-001	DD-102	BYA5D1	ED-1000	DC52	5HK-D1	
C68	10000		47A224	BPD-01	DD-103	BYA5E1	ED-01	DC51	5HK-E1	
C69	22	200	45D616-224M2	P268N-22		CUB2F22		GEM-3022	5TM-P22	
C70	22	600	45D616-224M5	P68EN-22		CUB6F22		GEM-6022	5TM-P22	
C71	1	200	45D616-104M2	P268N-1	DF-104	CUB2F1		GEM-301	5TM-P1	

Note 2: Some versions may use 390MMF Part #47A659) in this application.
Note 3: Some versions may use .047 @ 300V (part #45D618-473M2) in this application.
Note 4: Some versions may use a 10% - 547 @ 300V (part #45D618-473K2) in this application.

PARTS LIST AND DESCRIPTIONS

CONTROLS

ITEM No	RATING	REPLACEMENT DATA: TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	330K	33JN400	B-80	A47-500K-2	Q33-133	TA334A	Volume
B	Shaft		Not Req.	FS-2	Not Req.	Not Req.	
C	Switch		S2-1	SWS-13	T6-1	UA-36	
R2A	1500Ω	33JN390	B-515		Q17-109	U5	Contrast
B	Shaft		Not Req.		Not Req.	Not Req.	
R3A	5Meg	33JN401			Q17-141	TA56R	Brightness
B	Shaft				Not Req.	Not Req.	
R4A	1.5Meg	33JN402	B-742	A47-1.5Meg-S	Q11 139	U155	Vert. Hold
B	Shaft		Not Req.	FS-3	Not Req.	Not Req.	
R5A	75K	25-1305	B-35	A47-75K-S	Q11-125	PTA15L	Horiz. Hold
B	Shaft		Not Req.	FKH-1/3	Not Req.	Not Req.	
R6A	25Meg	33JN396					Vert. Linearity
B	5Meg						Height With 1Meg Stop

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R7	220K		33XJN334K	BTS-220K	
R8	15K		33XJN123K	BTS-12K	
R9	4700Ω		33XJN472K	BTS-4700	
R10	4700Ω		33XJN472K	BTS-4700	
R11	230K		33XJN234K	BTS-230K	
R12	2200Ω		33XJN222K	BTS-2200	
R13	4700Ω		33XJN472K	BTS-4700	
R14	15K		33XJN153K	BTS-15K	
R15	220Ω		33XJN221K	BTS-220	
R16	1Meg		33XJN105K	BTS-1Meg	
R17	10K		33XJN103K	BTS-10K	
R18	150Ω		33XJN151K	BTS-150	
R19	5Ω		33XJN5R0K	BTS-5R	
R20	150Ω		33XJN151K	BTS-150	
R21	180Ω		33XJN181K	BTS-180	
R22	6800Ω		33XJN682K	BTS-6800	
R23	2.7Meg		33XJN275K	BTS-2.7Meg	
R24	3.3Meg		33XJN335K	BTS-3.3Meg	
R25	3300Ω	7	24A123	PWV-3300	
R26	37K		33XJN373K	BTS-37K	
R27	130K		33XJN134K	BTS-130K	
R28	100K		33XJN104K	BTS-100K	
R29	33K		33XJN333K	BTS-33K	
R30	680K		33XJN684K	BTS-680K	
R31	270K		33XJN274K	BTS-270K	
R32	680K		33XJN684K	BTS-680K	
R33	680Ω		33XJN681K	BTS-680	
R34	2200Ω		33XJN222K	BTS-2200	
R35	120Ω		33XJN121K	BTS-120	
R36	37K	1	33XJN373K	BTS-37K	
R37	150Ω		33XJN151K	BTS-150	

ITEM No	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R38	15K		33XJN153K	BTS-15K	
R39	12K	1	33XJN123K	BTA-12K	Note 1
R40	18K	1	33XJN183K	BTA-18K	
R41	68K		33XJN683K	BTS-68K	
R42	100K		33XJN104K	BTS-100K	
R43	470K		33XJN474K	BTS-470K	
R44	180K		33XJN184K	BTS-180K	
R45	100K		33XJN104K	BTS-100K	
R46	100K		33XJN104K	BTS-100K	
R47	100K		33XJN104K	BTS-100K	
R48	1.5Meg		33XJN155K	BTS-1.5Meg	
R49	180Ω		23X20X181K		
R50	160Ω		23X20X161K		
R51	220K		23X20X224K	BTS-220K	
R52	33Meg		33XJN336K	BTS-33Meg	
R53	4700Ω		33XJN472K	BTS-4700	
R54	1Meg		33XJN205K	BTS-1Meg	
R55	1Meg		33XJN205K	BTS-1Meg	
R56	82K		33XJN823K	BTS-82K	
R57	12K		33XJN123K	BTS-12K	
R58	56K		33XJN563K	BTS-56K	Note 2
R59	47K		33XJN473K	BTS-47K	
R60	190K		33XJN394K	BTS-390K	
R61	1200Ω 5%		23X20X122J	BTS-1200 5%	
R62	330Ω		33XJN331K	BTS-330	
R63	390K		33XJN394K	BTS-390K	
R64	47K		33XJN473K	BTS-47K	
R65	180Ω		33XJN181K	BTS-180	
R66	680Ω		33XJN685EK	BTS-6800	
R67	39Ω	10	24-1098	1 3/4A-35	
R68	4.7Ω	5	24B118		

Note 1: "A" version uses a 22K, 1 W resistor (part #23X30X223K) in this application.
Note 2: Some versions may use an 82K (part #23X30X833K), an 82K paralleled by 180K, or a 68K (part #23X20X683K) in this application.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Rem PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.
T1	Horiz. Output Trans.	55-306							
T2	Vert. Output Trans.	55-309	I1900 ①					38875 ②	
T3	Yoke(90°)Horiz(24.5MH)Vert(11.5MH)	55-398							

① Connect #1 to plate; #2 to B+ ; #7 to yoke terminal #4; #10 to yoke terminal #6.
② Connect #1 to plate; #2 to B+ ; #7 to yoke terminal #6; #10 to yoke terminal #4.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.	NOTES
T4	4500Ω	3-4Ω	54C306	21107 ①	A-3088	A-3877 ①	24B51 ①	S-5X	① Drill one new mtg. hole.

SPEAKER

ITEM No.	TYPE: SIZE	TYPE: FIELD	TYPE: V. C. IMP.	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	85C175A	4A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	1st Video IF	51-2107				
L2	2nd Video IF	51-2166				
L3	3rd Video IF	50-668				
L4	RF Choke	53A307	19-1006		6884	18 Microhenries
L5	Shunt Peaking Coil	51-2103	19-1080		6148	750 Microhenries
L6A	4.5MC Trap	51B1096				
B	1st Sound IF					
L7	Shunt Peaking Coil	51-2102	19-6400a		6154a	296 Microhenries; Wound on 39000 resistor.
L8	Series Peaking Coil	51-2100	19-2180*	TV-184*	6180*	185 Microhenries; Wound on 47K resistor
L9	2nd Sound IF	51-2186				
L10	Quadrature Coil	51B1857			1480	
L11	RF Choke	51-343		*		7.5 Microhenries; IRC part #C1A

* Parallel with 47K resistor.
▲ Parallel with 39000 resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES: PRI.	DC RES: SEC.	REPLACEMENT DATA: TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No	Rem PART No.	Thordorson PART No.	Triad PART No.	NOTES
L12			51-2169	19-1575		6210 ①			HS-4		

① Enlarge mounting hole. A 3900MMF capacitor may have to be used in place of .0056 (C59).

FILTER CHOKE

ITEM No	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D C RESISTANCE	RATINGS: INDUCTANCE @ CURRENT 1000 °/₀₀	REPLACEMENT DATA: TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.
L13	.350A	23Ω	.5H	58A353	C6041 ①	C-3396 ①	C-3338 ①	38C44 ①	C-33X ①

① Drill one new mtg. hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	TRUETONE PART No.	REPLACEMENT DATA
X1	Sync Coupler	270MMF,220MMF,10000MMF, 330K, 2.2Meg	49A046	Aerovox PA-833 Cendrlab PC-383 Sprague ST-3

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: TRUETONE PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.
M1	.380A	37C336 ①	1023A ①	1N1007 ②	R3250S1 1 171 ① ③	6S350 ①	6QA2 ①	350A ①
M2		37C289 ①	1218 ① ③					

① Selenium type.
② Germanium type.
③ 2 required.

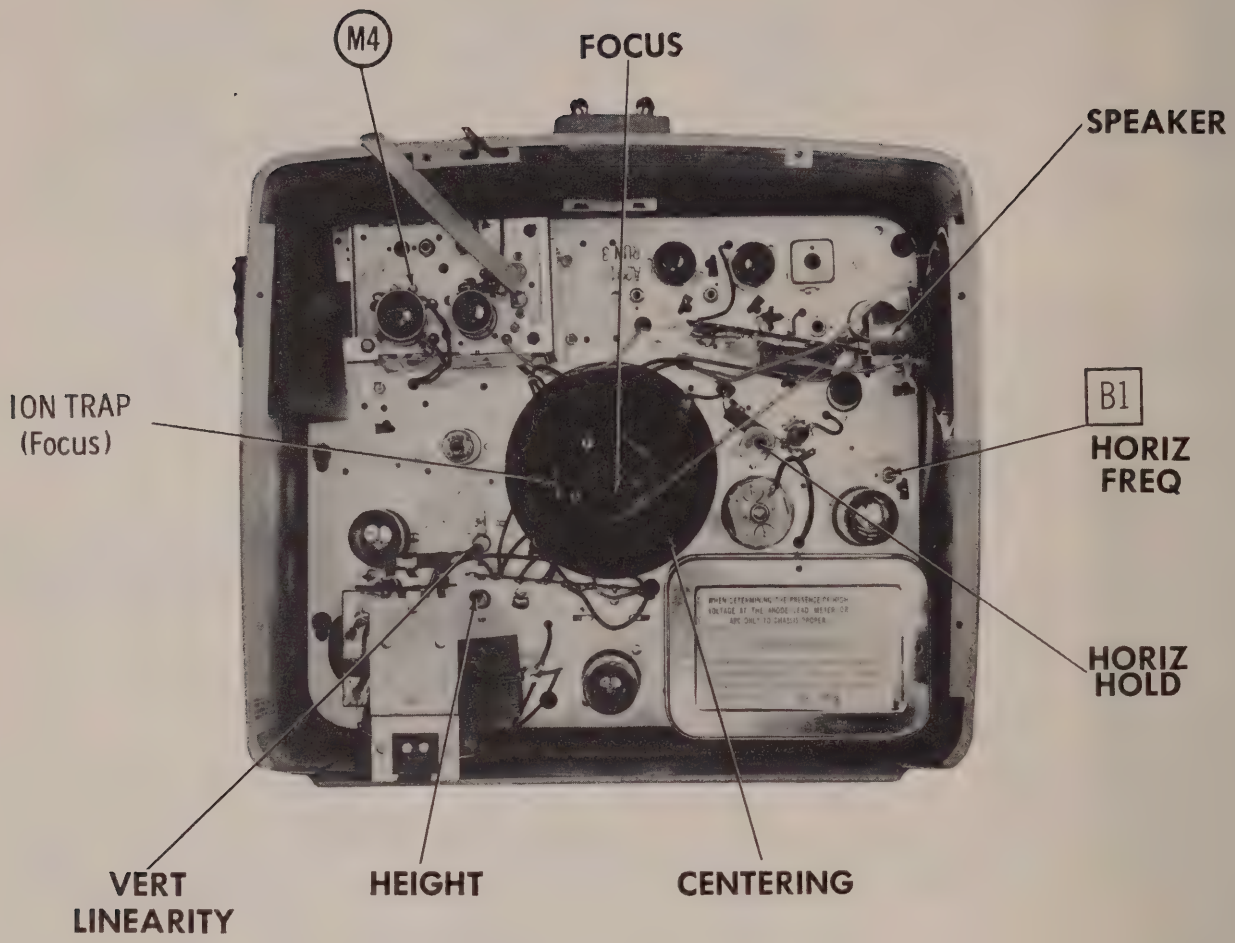
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: TRUETONE PART No.	SYLVANIA PART No.	NOTES
M3	1N60*	19C1864	1N60	Video Detector (Pigtail)

* A CK-706A may be used in this application.

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M4	Tuner	1-2087	VHF
M5	Centering Device	21B316	Models 2D3775A, B.
M6	Ion Trap	21B189	Models 2D3775A, B.
	Safety Glass	21D534	Models 2D3775A, B.
	Knob	15B1055	Control, 4 Used, Models 2D3775A, B
	Knob	15C1053	Fine Tuning.
	Knob	15A3040	Channel Selector, Models 2D3775A, B.
	Cabinet Front	41-80315	Model 2D3775A.
	Cabinet Front	41-80166	Model 2D3775A.
	Cabinet	41-80115	Models 2D3775A, B.



CABINET—REAR VIEW

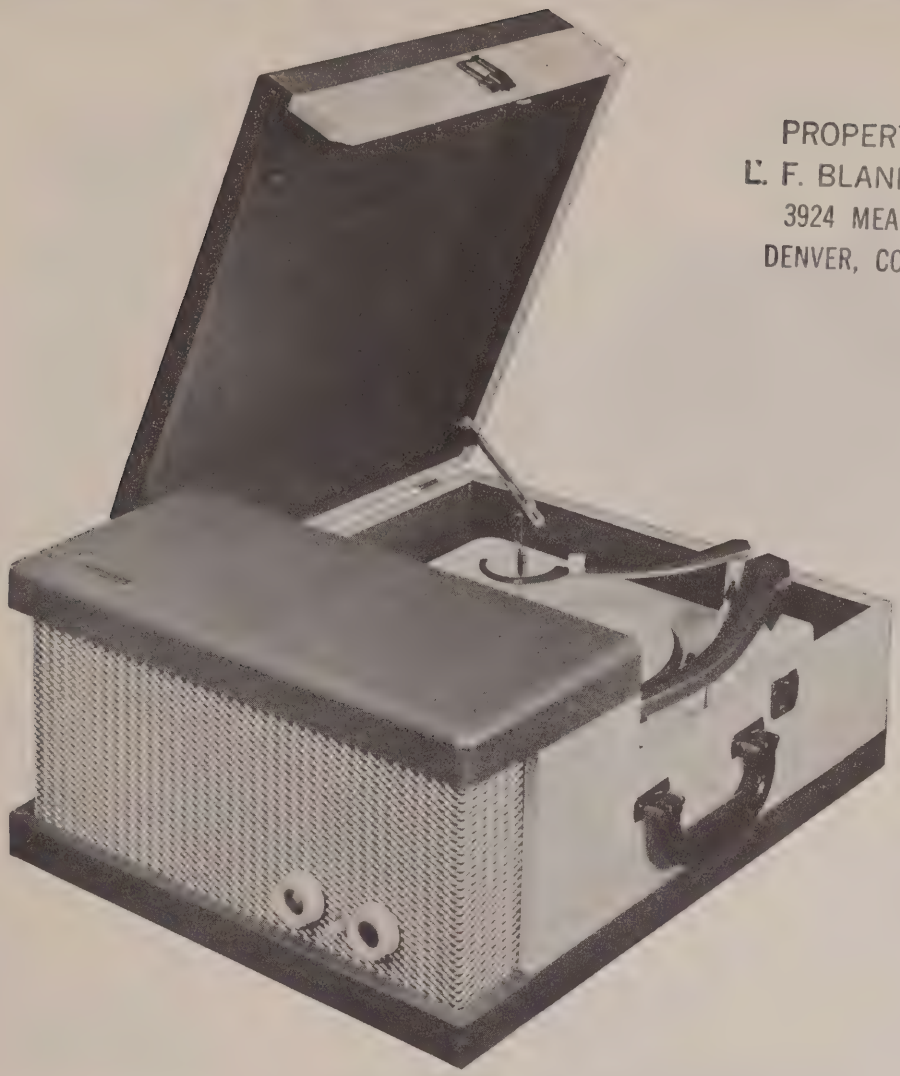
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

HORIZONTAL OSCILLATOR ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.
2. Set the horizontal hold control to its mid-range position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.
3. Check other stations and if necessary, retouch B1 for best sync action on all channels.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

V-M
MODEL 556-A



V-M
MODEL 556-A

TRADE NAME	V-M Model 556-A
MANUFACTURER	V-M Corp., Benton Harbor, Mich.
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Four)	Types 12AX7 AF Amp.-Phase Inv., (2) 6V6GT Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING .56 Amp. @ 117 Volts AC (56 Watts Without Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE V-M MODEL 1200A- PHOTOFACT SET 353.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1957 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under international Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

V-M MODEL 556-A

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. -Phase Inverter	12AX7	
V2	Output	6V6GT	
V3	Output	6V6GT	
V4	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA V-M PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■20	450	12011	AFH4-14	DO130	FP444	TMQ-12	Q-040	TVL-4763
B	▲20	450							
C	20	450							
D	●20	450							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA V-M PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	33		12047	SI 33	D6-330	L10Q33	ED-33	UC-5433	5GA-Q33	
C3	.0022	400	12049	BPD-0022	D6-222	CUB6D22	ED-0022	GEM-6222	6TM-D22	
C4	.0022	400	12049	BPD-0022	D6-222	CUB6D22	ED-0022	GEM-6222	6TM-D22	
C5	.047	400	12009	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C6	.047	400	12009	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C7	.047	400	12009	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C8	680		12039	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA V-M PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	5Meg	½	12300	B-88	A47-5Meg-Z	Q13-141	U65	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	1Meg	½	11982	BB-108	AD47-1Meg-S	Q11-137	UF16L	Tone
B	1Meg	½		Not Req.	Not Req.	M11-137	UR16L	Tone
C	Shaft			AK-16 ‡	KSS-3	Not Req.	DS-36 †	

‡ Use shaft of original control with AK-16 coupler.
† Special 3" extension shaft.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA V-M PART No.	IRC PART No.	NOTES
R3	220K		11293	BTS-220K	
R4	220K		11293	BTS-220K	
R5	3900Ω		10873-10	BTS-3900	
R6	22K		11053	BTS-22K	
R7	22K		11053	BTS-22K	
R8	1Meg		11453	BTS-1Meg	
R9	220K		11293	BTS-220K	
R10	220K		11293	BTS-220K	

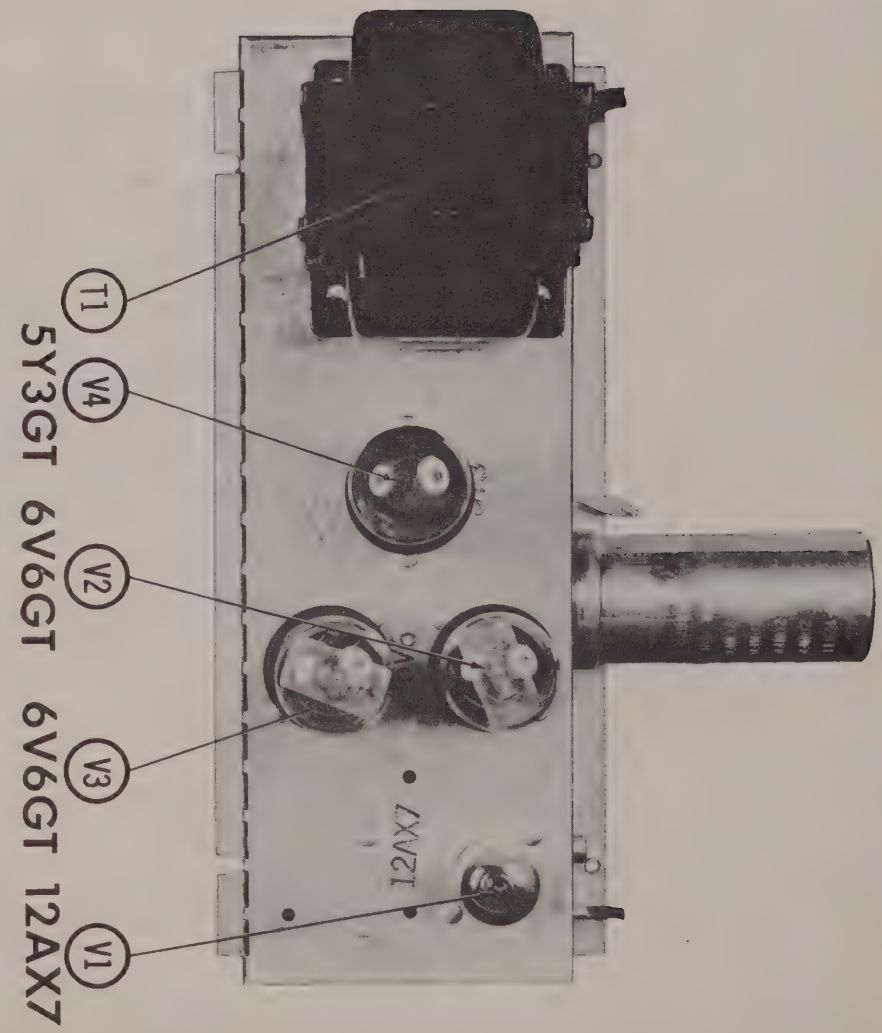
ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA V-M PART No.	IRC PART No.	NOTES
R11	1000Ω		10733	BTS-1000	
R12	470K		11373	BTS-470K	
R13	470K		11373	BTS-470K	
R14	10K		10973	BTS-10K	
R15	200Ω	5	11979	PW7-200	
R16	47K			BTS-47K	
R17	470Ω	2	10655	BTB-470	
R18	100K		11213	BTS-100K	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA V-M PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ②.56A	546VCT ②.077A	5VAC ② 2A	6.3VCT ②1.3A	12518	P9204		PC8403	22R02 ①	R-8A

① Use Universal mounting brackets.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	V-M PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5400Ω CT	2.8Ω	12519	Z1011	A-2905 ①	A-3870	22S58	S-55X	① Drill one new mtg. hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	V-M PART No.	QUAM PART No.	
SP1	3½"	PM	14Ω	7130 ①	3A15T ①	① Parallel & phase.
SP2	8"	PM	3-4Ω	7129 ①	8A10Z3.2①	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	V-M PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M1	7477	55-T	GD-J	56	PT-2	

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

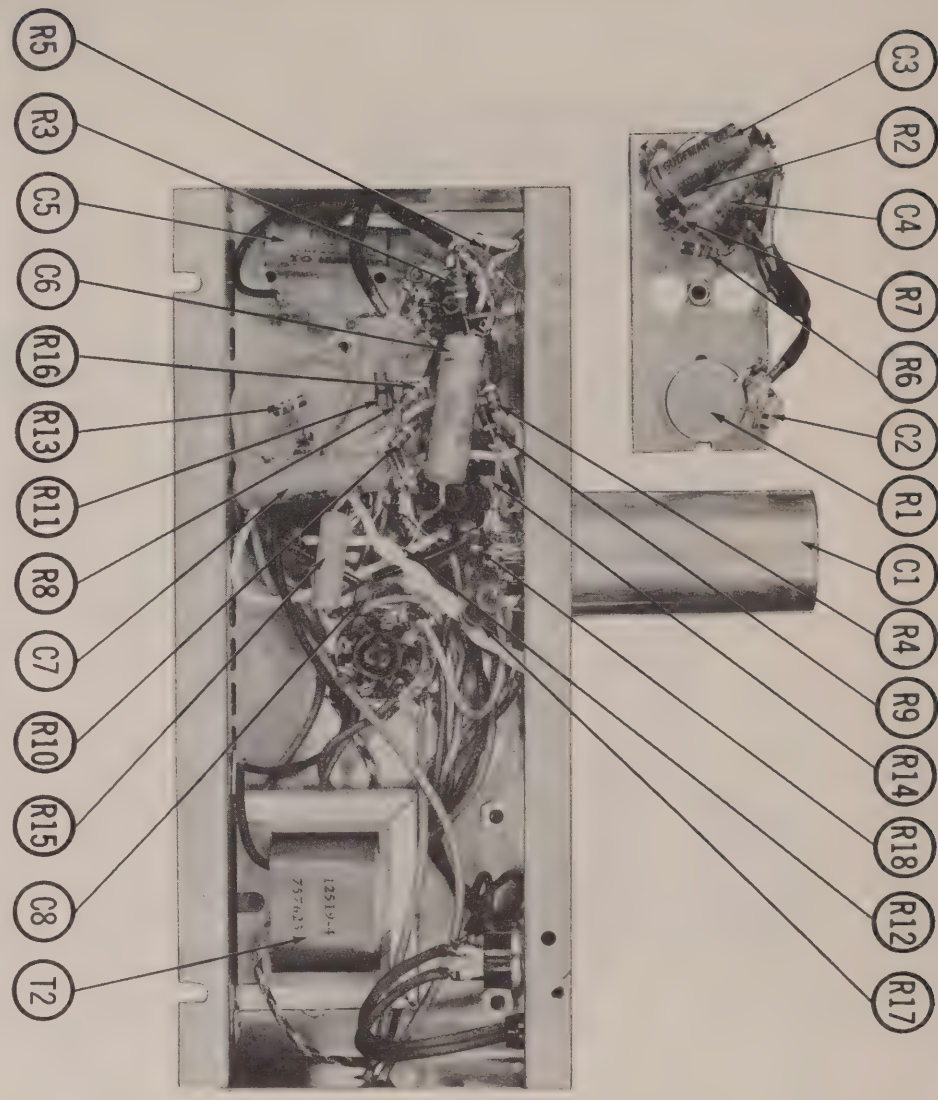
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	V-M PART No.	JENSEN PART No.	WALCO PART No.	
M2		†S-66 or †♦S-66SD or ♦S-66D	†W-75TPS or †♦W-75DS or ♦W-75TPD	† Jewel ♦ Diamond

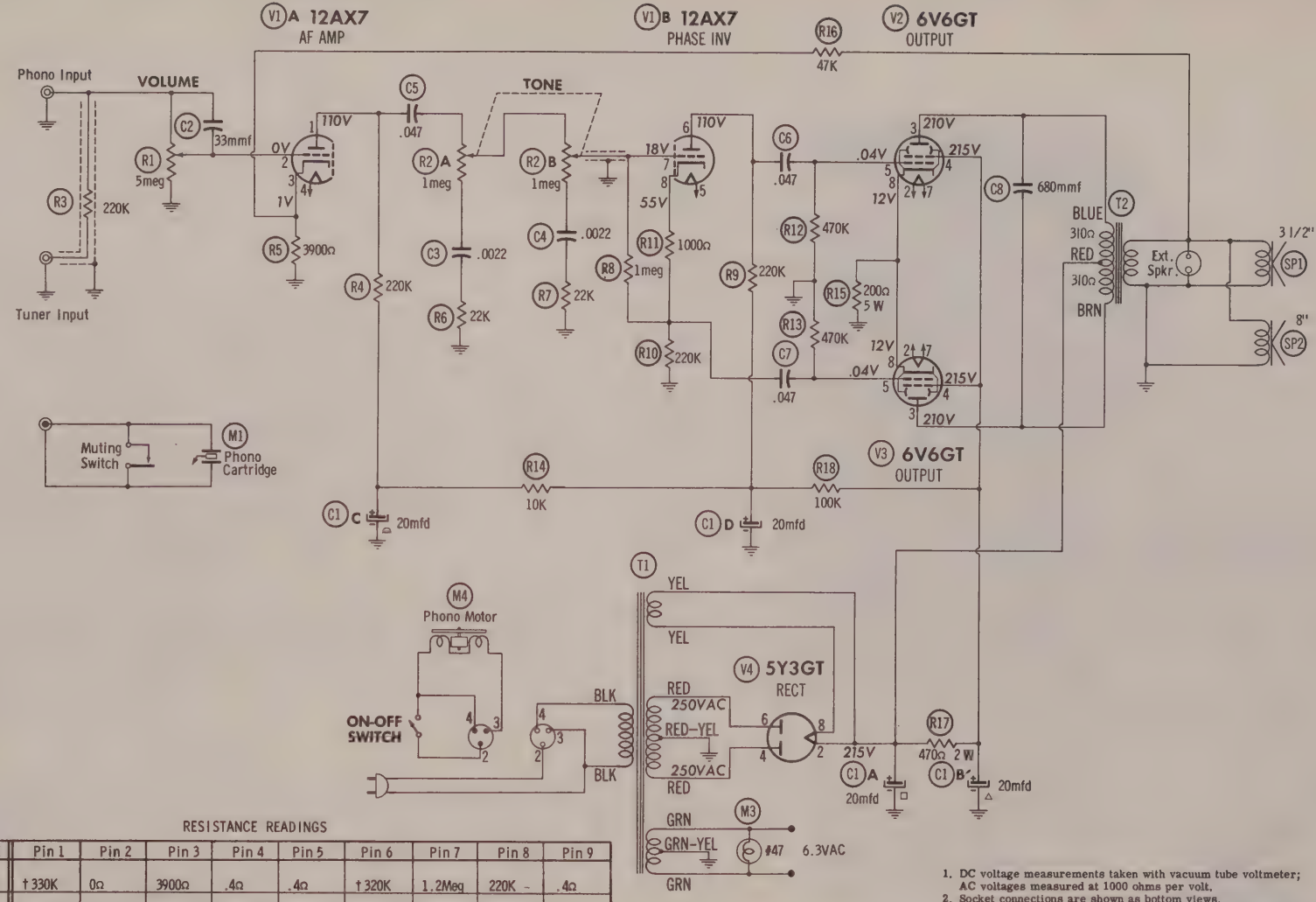
MISCELLANEOUS

ITEM No.	PART NAME	V-M PART No.	NOTES
M3	Pilot Light	7791	#1847
M4	Phono Motor	6950	
	Knob	5846	2 Used
	Cabinet	9109	

CHASSIS—BOTTOM VIEW



V-M MODEL 556-A



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†330K	0Ω	3900Ω	.4Ω	.4Ω	†320K	1.2Meg	220K -	.4Ω
V2	6V6GT	NC	.4Ω	†310Ω	†470Ω	470K	TP	.4Ω	200Ω	
V3	6V6GT	NC	.4Ω	†310Ω	†470Ω	470K	TP	.4Ω	200Ω	
V4	5Y3GT	NC	50K	NC	82Ω	NC	75Ω	NC	50K	

† MEASURED FROM PIN 2 OF V4.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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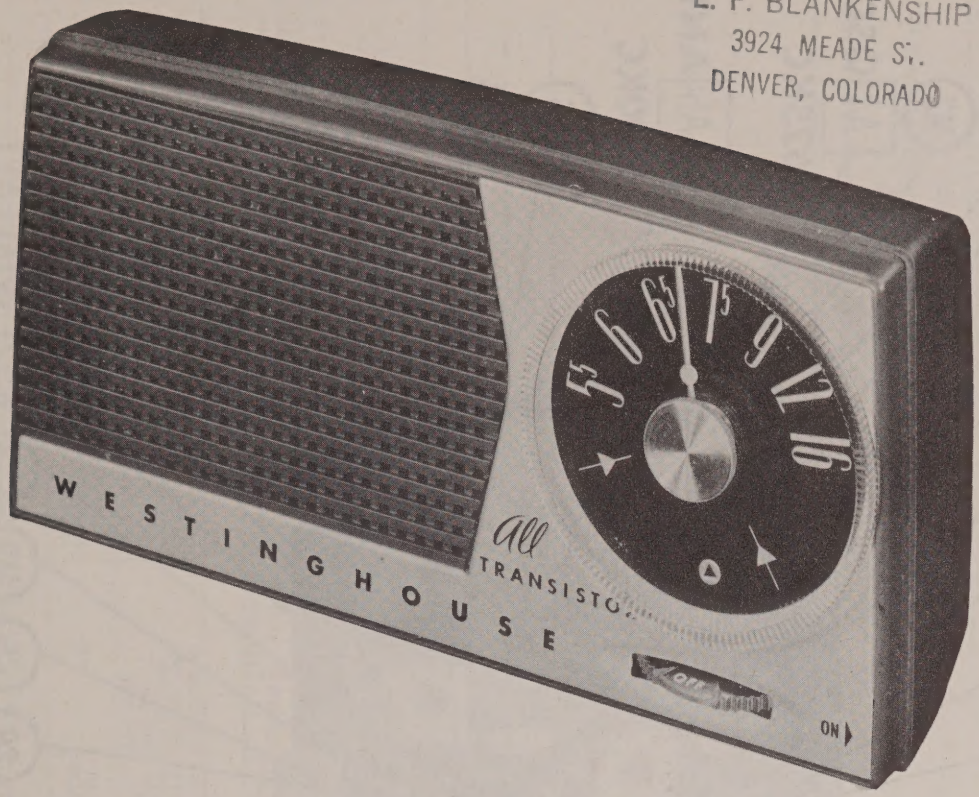
WESTINGHOUSE MODELS H-610P5, H-611P5, H-612P5 (Ch. V-2278-2)



WESTINGHOUSE MODELS H-610P5, H-611P5, H-612P5 (Ch. V-2278-2)

TRADE NAME	Westinghouse Models H610P5, H611P5, H612P5 (Ch. V-2278-2)
MANUFACTURER	Westinghouse Electric Corp., TV-Radio Div., Metuchen, N. J.
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	9 Volts DC
RATING	26 MA @ 9 Volts DC
TUNING RANGE—BROADCAST	540KC - 1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400∿ Mod)	Tuning gang fully closed.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1625KC	Tuning gang fully open.	"	A4	"
3.		"	1400KC	Tune to 1400KC signal.	"	A5	"

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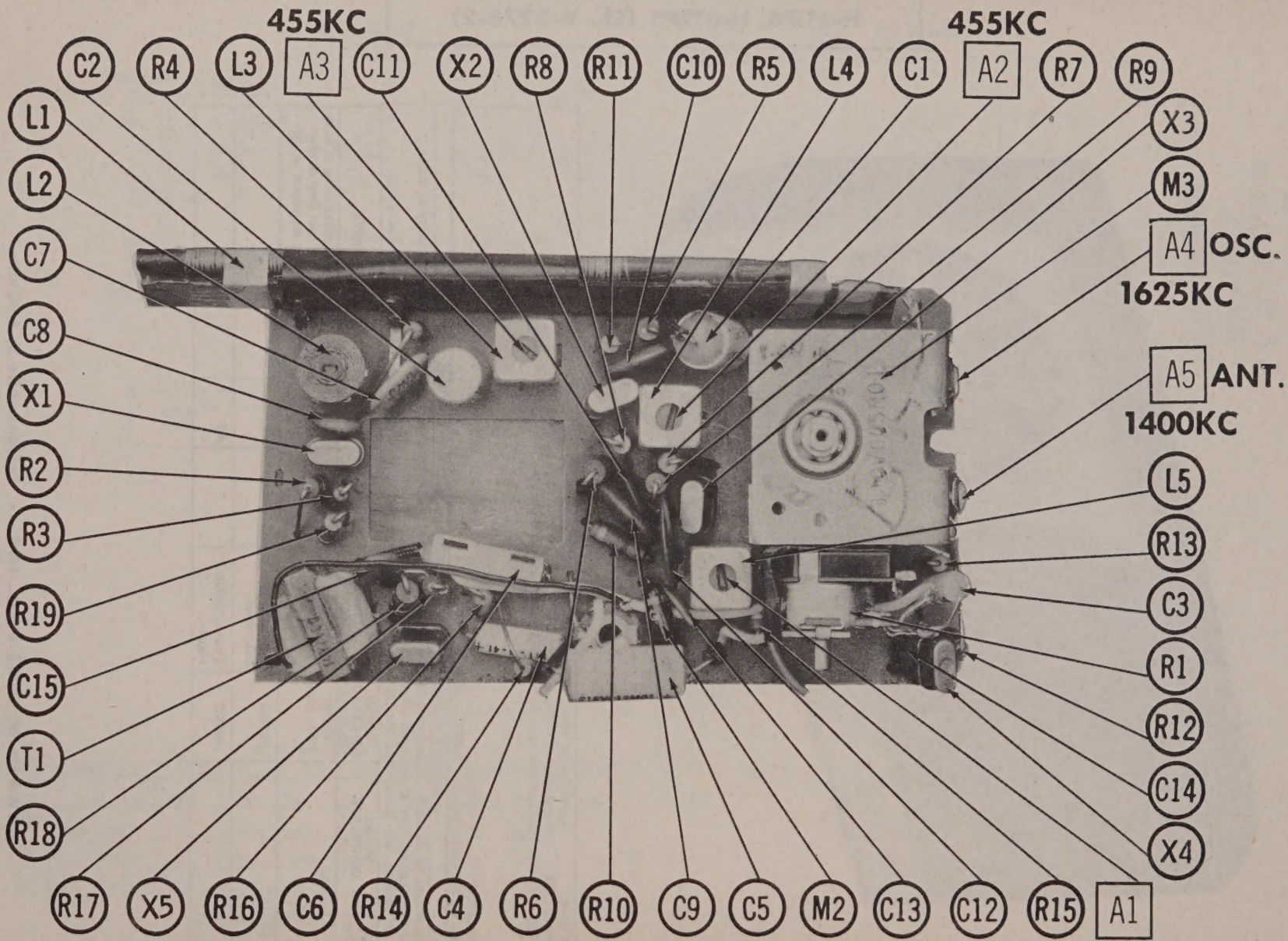


CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	USE		Westinghouse PART NO.	NOTES
X1	Converter	(2N252)	297V008M01	
X2	1st IF Amp.	(2N253)	297V002M04	
X3	2nd IF Amp.	(2N254)	297V002M05	
X4	Driver	(2N238)	297V004M01	Note 1
X5	Output	(357)	297V009M01	Note 2

Note 1: Some versions may use type 310.
Note 2: Some versions may use type 2N149.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	40	10	218V012M01	XPP10V40	NL50-10	TT10X50	ML40-15		
C2	40	3	218V012M10	XPP3V40	NL40-3	TT3X40	ML40-6		TE-1057
C3	5	12	218V012M09	XPP12V5	NL5-15	TT12X5	ML5-15		TE-1127
C4	5	12	218V012M09	XPP12V5	NL5-15	TT12X5	ML5-15		TE-1127
C5	40	10	218V012M01			TT10X50	ML40-15		
C6	40	3	218V012M02	XPP3V40	NL40-3	TT3X40	ML40-6		TE-1057

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C7	4700		215V300M04	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C8	1000		215V300M15	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C9	10000		215V300M12	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C10	10000		215V300M12	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C11	10000		215V300M12	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C12	50000		215V303M03	BPD-05	DF-503					
C13	20000		215V303M04	BPD-02	DD-203	BYA6S2	ED-02	DC522	5HK-S2	Note 1
C14	1000		215V300M15	BPD-001	DD-102	BYA6D1	ED-001	DC521	5HK-D1	
C15	1000		215V300M15	BPD-001	DD-102	BYA6D1	ED-001	DC521	5HK-D1	Note 2

Note 1: Early versions use .1MFD (Part #215V303M02).
Note 2: Early versions use .05MFD (Part #215V303M03).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/4	270V024M01					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Westinghouse PART No.	IRC PART No.	
R2	39K		250V223A93	BTS-39K	
R3	8200Ω		250V228A22	BTS-8200	
R4	4700Ω		250V224A72	BTS-4700	
R5	1000Ω		250V231A02	BTS-1000	
R6	100Ω		250V221A01	BTS-100	
R7	15K		250V221A53	BTS-15K	
R8	1000Ω		250V221A02	BTS-1000	
R9	470Ω		250V224A71	BTS-470	
R10	1500Ω		250V221A52	BTS-1500	
R11	56K		250V235A63	BTS-56K	
R12	22K		250V222A23	BTS-22K	
R13	3300Ω		250V223A32	BTS-3300	
R14	2200Ω		250V222A22	BTS-2200	
R15	1000Ω		250V221A02	BTS-1000	
R16	12K		250V221A23	BTS-12K	
R17	1500Ω		250V221A52	BTS-1500	
R18	39Ω		250V223A90	BTS-39	
R19	470Ω		250V224A71	BTS-470	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	510Ω	12Ω	430V034M01				TR-19 ①		① Do not use center tap on primary winding. Bend mtg. tabs under.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Westinghouse PART No.	QUAM PART No.	
SP1	2 3/4"	PM	12Ω	570V004M01		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		Westinghouse PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	310V012M02				
L2	Osc. Coil	230V026M01				
L3	1st IF Trans.	235V014M01				
L4	2nd IF Trans.	235V014M01				
L5	3rd IF Trans.	235V014M02				

BATTERIES

ITEM No.	VOLTAGE	Westinghouse PART No.	REPLACEMENT DATA								
			BURGESS			EVEREADY			MALLORY		
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	"A"	"B"	"A-B"
M1	9V			226			P-6			M1600	

CRYSTAL DIODES

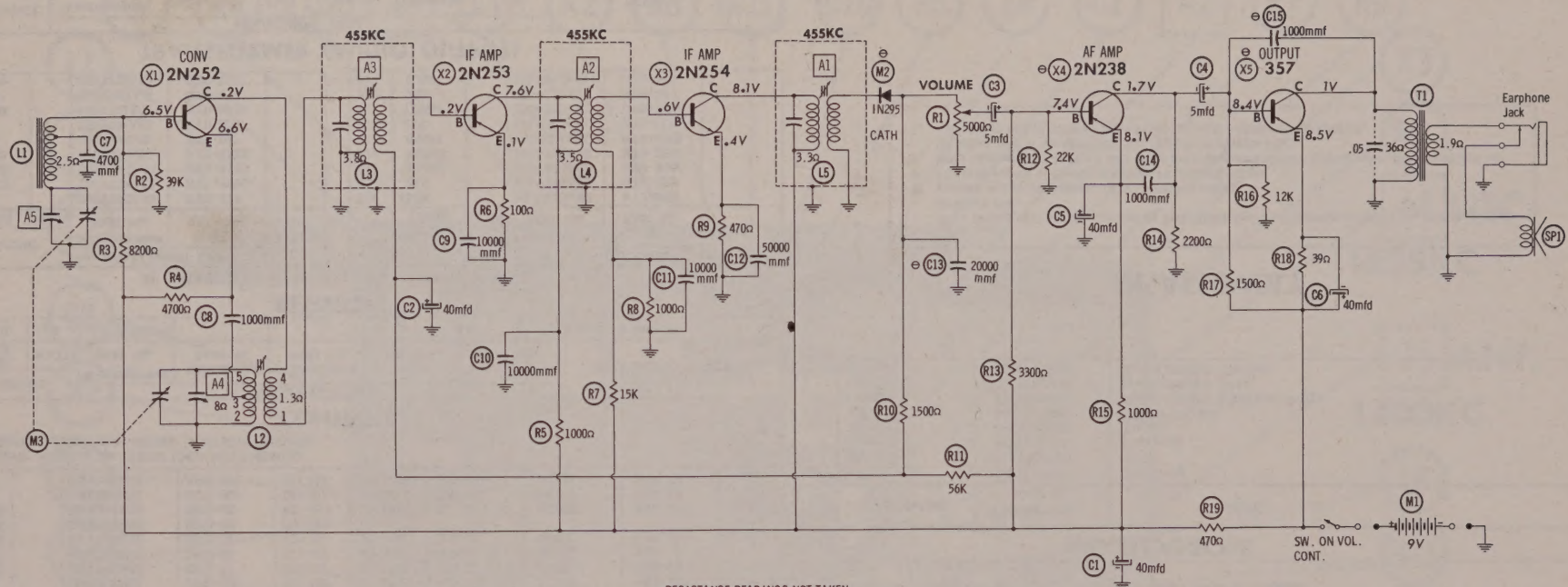
ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		Westinghouse PART No.	SYLVANIA PART No.	
M2	1N87G or 1N295	296V002M01	1N60	Audio Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M3	Tuning Cap.	330V005M01	Two Gang
	Ear Piece	753V003M01	
	Case	513V012M01	Carrying
	Knob	580V033M01	Tuning
	Knob	550V017M01	On-Off-Volume
	Cabinet	513V006M04	Model H610P5 (Charcoal Gray)
	Cabinet	513V006M05	Model H611P5 (Blue)
	Cabinet	513V006M06	Model H612P5 (Yellow)

DISASSEMBLY

1. Turn tuning dial to high frequency end. Hold dial and remove screw from center of dial. Remove dial.
2. Loosen screw on cabinet back. Remove back.
3. Remove screw at tuning gang end of printed board.
4. Hold cabinet with back up and slide printed board toward tuning gang end of cabinet until upper end of speaker bracket is free of plastic lip.
5. Lift upper end of printed board over lip and remove from cabinet.



OSC COIL TOP VIEW

RESISTANCE READINGS NOT TAKEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal apllied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

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